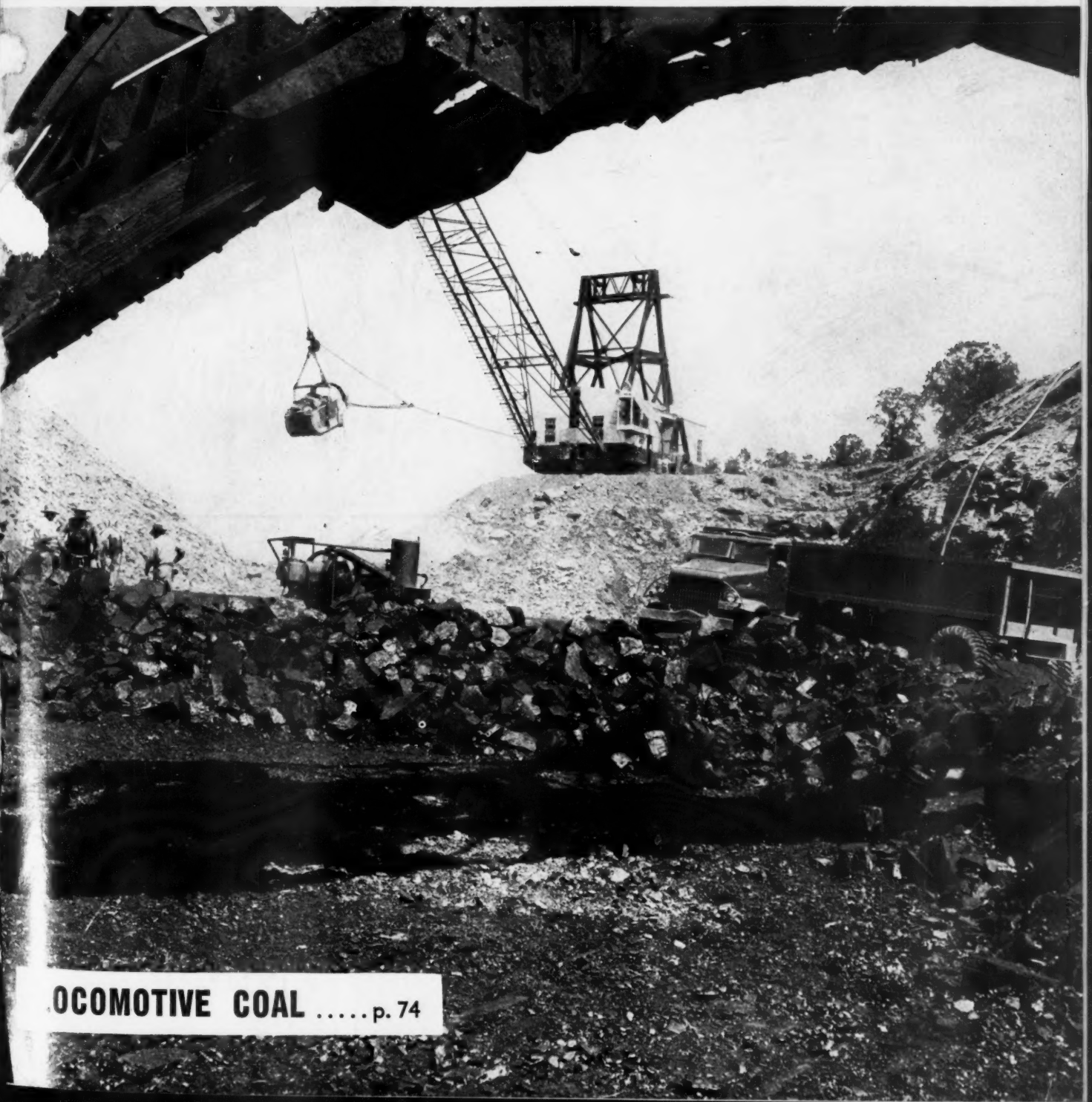


# Coal Age

A MCGRAW-HILL PUBLICATION

DECEMBER, 1947



LOCOMOTIVE COAL ..... p. 74

# A Clean Saving of \$1664



## SUN MINE LUBRICANT...

**Ends Gummy Condition in Joy Loaders, Eliminates Need for Cleaning Machines Every 2 or 3 Days**

A Pennsylvania mine was loading coal under severe moisture conditions with Joy Loading Machines. Mine water reacted with the greases being used and caused them to separate and gum. This necessitated complete cleaning of the transmission case and gathering heads every two or three days if breakdowns were to be avoided.

**A Sun Engineer was consulted** and after careful study of the conditions, he recommended a specially prepared Sun Mine Lubricant.

**When this Sun Lubricant was used** the old gummy conditions disappeared. The Sun grease lasts six times as long, and now the machines have to be cleaned only every two or three weeks. Management has estimated the annual savings at \$1664.

**This case is typical** of the performance that can be expected with Sun "Job Proved" lubricants. For the help of the Sun Engineer in keeping costs down and mine equipment operating steadily, call your nearest Sun office today. Or write Department CA-12.

**SUN OIL COMPANY • Philadelphia 3, Pa.**

*In Canada: Sun Oil Company, Ltd.—Toronto and Montreal*

**SUN**  
  
**INDUSTRIAL  
PRODUCTS**





## Where rubber lasted 14 times as long as steel

*A typical example of B. F. Goodrich improvement in rubber*

THAT rain of rocks formerly wore out half-inch steel plates every six months.

Gravel plants separate their stones by size, for different uses—and the big ones really punish anything they hit. To make it worse, the steel plates, onto which the stones used to slide, are hard to get at, and replacement was a nuisance as well as a high cost.

Someone had heard that B. F. Goodrich had a rubber called Armorit, specially compounded to stand this sort

of beating. The plate that catches the rocks shown in the picture was covered with this BFG rubber seven years ago.

Since then 800,000 tons of gravel have been processed in this plant and there still is no sign of wear on this water-lubricated rubber. It has lasted 14 times as long as steel a half inch thick.

Developing special rubbers to meet special conditions like this is a regular occurrence at B. F. Goodrich. Don't think of rubber as a single material.

B. F. Goodrich engineers have developed hundreds of rubbers to meet hundreds of special problems—to stand heat, acids, oils, sunlight, exceptional wear, abrasion, tearing and many other conditions. Don't decide that rubber cannot serve you or improve your product or process until you find out what B. F. Goodrich has developed. *The B. F. Goodrich Company, Industrial Products Division, Akron, Ohio.*

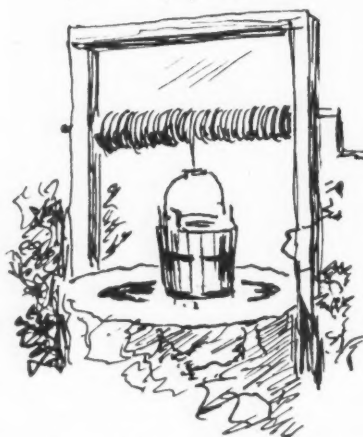
**B. F. Goodrich**  
FIRST IN RUBBER

# Make no mistake

FOR  
INSTANCE...

**Are you mistaken about**

**"THE OLD  
OAKEN BUCKET?"**



Clear water from deep wells is popularly supposed pure and to be safe to drink whereas the fact is that there is not the slightest indication of purity or safety in mere clearness or origin from great depths.

Speaking of indications — note the word "QUALITY" incorporated in the name HULBURT QUALITY GREASE! It means that HULBURT QUALITY GREASE definitely IS a QUALITY product. It ranks first with experienced Coal operators because it does well the one job it is carefully compounded for and qualified to do — i.e., perfectly lubricate coal mining machinery. A Hulburt Lubrication Engineer will go deep into your mine to advise on the proper use of HULBURT QUALITY GREASE, if you desire.

HULBURT OIL & GREASE COMPANY—PHILADELPHIA, PENNA.

*Specialists in Coal Mine Lubrication*



for Coal Mine Lubrication

*use*



**HULBURT**

*Quality* **GREASE**

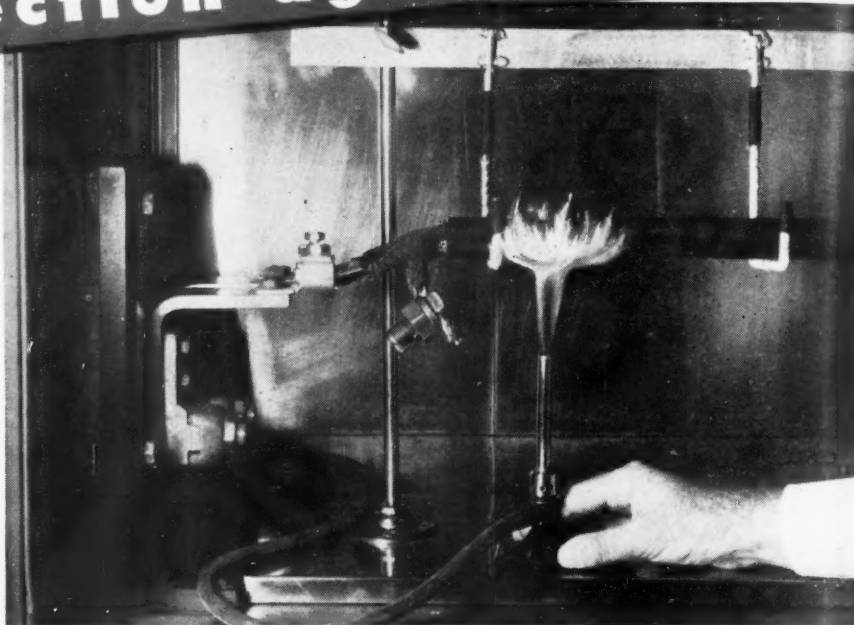
PROVEN BY PERFORMANCE

# SELECT HAZARD

## PORTABLE CABLES

### for protection against fire

• Hazaprene Cables meet this new flame-resistance test of Penna. Dept. of Mines which includes application of flame for one minute after the cable has been overloaded 400% and sheath temperature has reached 350 degrees F.



Meeting the new rigid requirements for fire-resistant trailing cables established by the Penna. Dept. of Mines is no problem at Hazard. For several years, all Hazard trailing cables have been built with a Hazaprene jacket made with neoprene to give them high flame-resistance as well as other important qualities. This Hazard jacket fully meets the new requirements of Pennsylvania and now carries the official approval symbol P-104.

And with Hazaprene cable, you can also count on getting all the other life-extending properties you want with trailing cables. You get a tough jacket that's pressure-cured in a continuous metal mold for maximum density, extra surface smoothness, good all-around resistance to mechanical damage. You get a sheath resistant to oil, acids, chemicals, grease and water. Hazard Insulated Wire Works, Division of The Okonite Company, Wilkes-Barre, Pa.



• Hazaprene Flame-Resistant Twin-Parallel Mining Machine Cable. Penna. Dept. of Mines Approval P-104.

# HAZARD



insulated wires and cables for every mining use





Alfred M. Staehle, *Publisher*

IVAN A. GIVEN, *Editor*

J. H. Edwards R. R. Richart

W. H. McNeal W. A. Stanbury Jr.

F. A. Zimmerli

Donald D. Hogate, *Washington*

H. R. Mathias, *General Manager*

World News Offices: London, Paris,  
Berlin, Moscow, Tokyo, Bombay,  
Melbourne, Rio de Janeiro, Buenos  
Aires



COAL AGE (with which is consolidated "The Colliery Engineer" and "Mines and Minerals") is published monthly on the 1st. Allow at least ten days for change of address.

Subscription rates: United States and possessions, \$5 for one year, \$8 for two years, \$10 for three years; Canada, \$6 for one year, \$10 for two years, \$12 for three years; Pan American countries, \$6 for one year, \$10 for two years, \$12 for three years. All other countries, \$15 for one year, \$30 for three years. Single copies, 50 cents each. Entered as second class matter April 22, 1947, at the Post Office at Chicago, Ill., under the Act of March 3, 1879. Printed in the U. S. A. Cable Address: "McGraw-Hill N. Y." Member A.B.P. Member A.B.C. Please indicate position and company connection on all subscription orders.

#### Return Postage Guaranteed

Contents Copyright 1947 by  
McGraw-Hill Publishing Co., Inc.:  
all rights reserved

JAMES H. MCGRAW  
Founder and Honorary Chairman

JAMES H. MCGRAW JR.  
President

CURTIS W. MCGRAW  
Senior Vice President and Treasurer

JOSEPH A. GERARDI  
Secretary

NELSON BOND  
Director of Advertising

EUGENE DUFFIELD  
Editorial Assistant to the President

J. E. BLACKBURN JR.  
Director of Circulation

Publication office, 210 South Desplaines St., Chicago, Ill. Editorial and executive offices, 330 W. 42nd St., New York 18, N. Y. Branch offices: 520 North Michigan Ave., Chicago 11; 68 Post St., San Francisco 4; Aldwych House, Aldwych, London, W.C. 2; Washington, 4; Philadelphia 3; Cleveland, 15; Detroit, 26; St. Louis, 1; Boston, 16; Atlanta, 3; Los Angeles, 14; 738-9 Oliver Bldg., Pittsburgh, 22.

All communications about subscriptions should be addressed to the Director of Circulation, Coal Age, 210 South Desplaines St., Chicago, Ill., or 330 West 42nd St., New York 18, N. Y.

District Managers: T. E. Alcorn and F. W. Roets, New York; W. A. Potter, Philadelphia; W. M. Spears, Cleveland; H. C. Chellson, Pittsburgh; C. J. Coash, G. A. Mack, Chicago.

## CONTENTS

Volume 52

DECEMBER, 1947

Number 12

Coal on the Locomotive Front.....	74
By EARL C. PAYNE	
Strippers Moved 12 Miles.....	79
By W. E. PARKS	
Pond Creek Productivity Upped.....	82
By J. H. EDWARDS	
High-Pressure Sprays Trap Dust.....	86
The Marshall Program.....Facing	88
Preventing Rectifier Corrosion.....	89
By D. W. BORST	
Alloy Cage Dumps Sideways.....	94
By J. H. EDWARDS	
Deepwell Pumps Put Underground.....	98
Four Pins, Two Ties Support Twin Crossbars.....	104
Shop-Built Horizontal Drill Is Self-Propelled.....	106
Bridge Makes Crossing Safer.....	106
Hydraulic Test Bench Serves New Shop.....	108
Automatic Signal Indicates Fan Breakdown.....	108
Fire Car Fights Mine Fires at Long Range.....	110
Truck Replaces Rail Car for Rock Haulage.....	112
Fuses Protect Telephones.....	112
Editorials.....	73
Foremen's Forum.....	100
News Round-Up.....	115
Coal Men on the Job.....	122
Equipment News.....	166

### CHANGE OF ADDRESS

Director of Circulation, COAL AGE  
330 West 42nd St., New York 18, N. Y.

Please change the address of my COAL AGE subscription as follows:

Name .....

Old Address.....

New Address.....

New Company Connection.....

New Title or Position.....

# Why GOOD Spooling Pays

The picture below is a fine example of how wire rope should be spooled. It shows thoughtfulness and care on the part of the operator. Spooling like this pays off in longer rope life, smaller rope expense.

In contrast, poor spooling is a direct blow to the pocketbook. When rope is not spooled in smooth, even, regular layers, the resulting cross-wrap can be very damaging. Rope that does not follow its true course around the drum is subject to unnatural pressures; forces that crush and distort. A crushed rope is unsafe and must soon be discarded.

Moreover, when the bottom layers

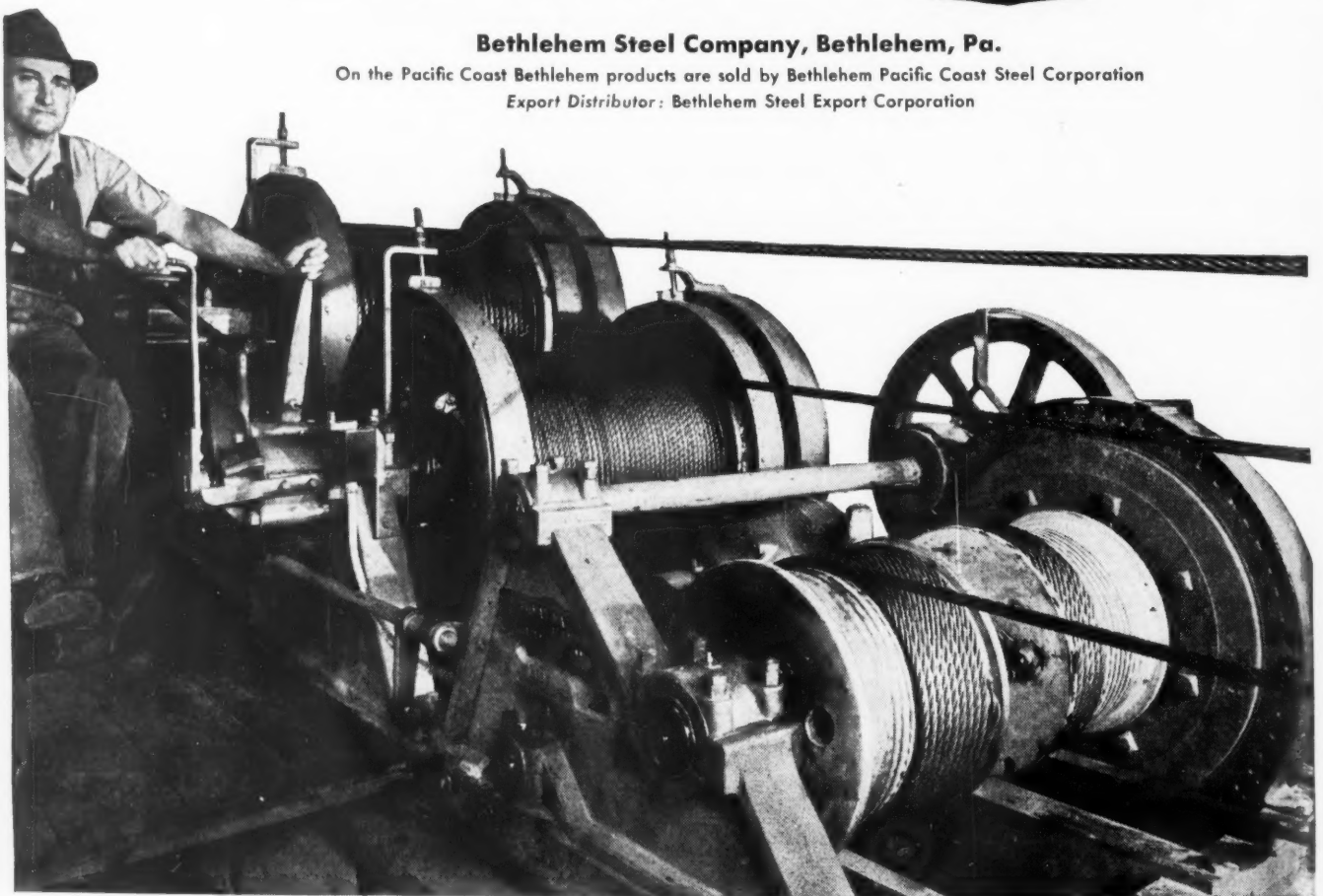
are not tightly spooled, a portion of the line above may "cut through" suddenly, causing momentary shock. Later, during unwinding, the rope sometimes snaps back with a powerful jerk that can injure both rope and machines.

We know of few more abusive practices than bad spooling. Care can help prevent it—can help reduce your rope bills. For further information, talk with a Bethlehem field engineer.



**Bethlehem Steel Company, Bethlehem, Pa.**

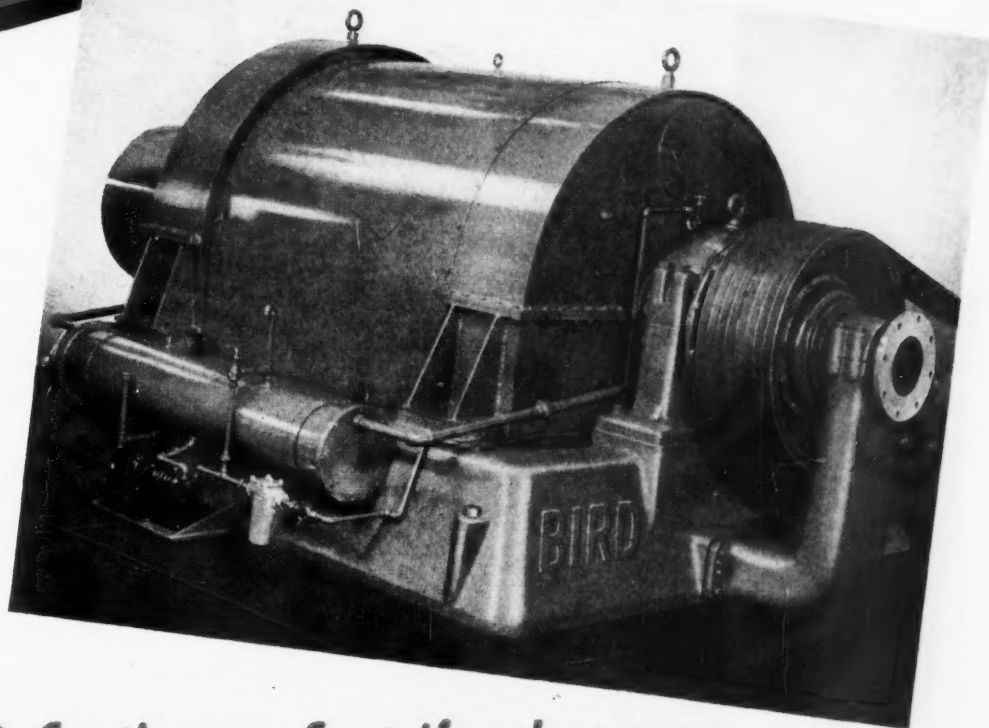
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation  
Export Distributor: Bethlehem Steel Export Corporation



**When you think WIRE ROPE . . . think BETHLEHEM**



Here's the **ONE BEST WAY** to  
get the water out of your  
fine coal after washing...



## **The BIRD Continuous Centrifugal FILTER**

Whatever type of washing system you use, the BIRD takes out the water so clean that it can be used over and over — discharges the fine coal so dry it's all ready for blending — does the job continuously, at exceedingly low cost of operation and maintenance.

Let us tell you more about it.

**BIRD MACHINE COMPANY**  
SOUTH WALPOLE • MASSACHUSETTS

# More Tonnage . . .



## LOW-HEAD SCREENS

This is modernization that cuts coal preparation costs — two Allis-Chalmers "Low-Head" vibrating screens dewatering coal. Used with End-Tension Deck for dewatering small size coal and for screening and dewatering sludge in sizes as fine as 35 mesh. Side tension deck for wet screening and dewatering larger size coal. Sizes up to 6 x 16 ft. Bulletin 07B6330A.

---

# ALLIS-CHALMERS



# SAVE MONEY TOO!

**B**EST BET for more *profitable* coal operations is *modern* equipment. Best results in coal are being obtained by producers who have installed tonnage-increasing, cost-cutting equipment of the type built by Allis-Chalmers.

The increasing use of Allis-Chalmers "Ripl-Flo" and "Low-Head" vibrating screens, for example, is resulting in speedier production . . . substantially lowered preparation costs . . . increased preparation plant recovery.

Stationary and portable mine unit substations . . . all-

electric hoists . . . long life motors and Texrope drives . . . distribution transformers—these, too, are Allis-Chalmers products that have won wide acceptance in coal.

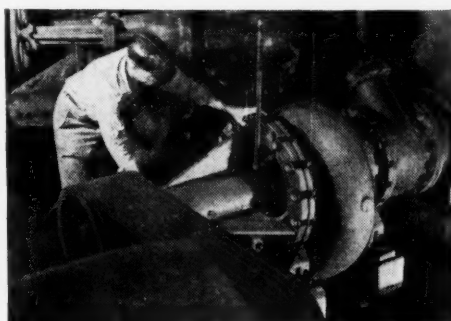
The development by Allis-Chalmers of centrifugal pumps for slurry handling, gathering and recirculation has been a big factor in lowering coal pumping costs.

There is an A-C representative near you who can tell you more about Allis-Chalmers' line of equipment for coal. Call him today. ALLIS-CHALMERS, MILWAUKEE 1, Wis.

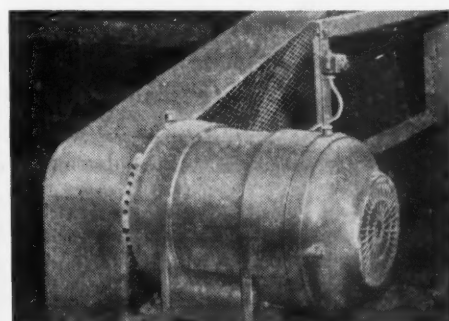
A 2334



**TEXROPE DRIVES** Gritty atmospheres do not harm Allis-Chalmers Texrope drives. Long-life duplex-sealed belt covers offer maximum resistance to abrasion . . . reduce the possibility of belt failure. Speed ratios 7:1. Mine pump installation shown above. Bulletin 20B6051G.



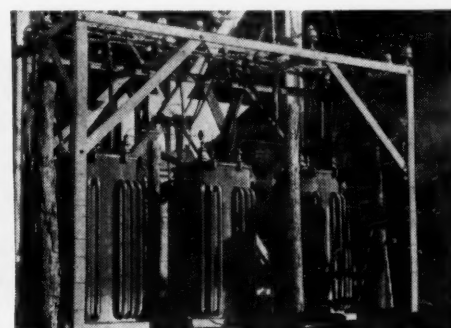
**SOLIDS PUMP** Solids-Handling pump was developed by Allis-Chalmers especially for coal . . . handles up to 40 percent solids in slurries, tailings, sludges. Has only five *easily removed* working parts—big parts inventory savings! 175 to 7,000 gpm; heads to 100 ft. Bulletin 08B6381B.



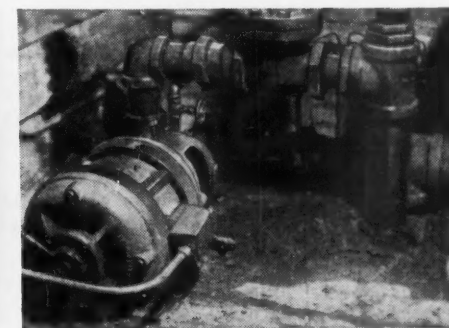
**MOTORS** Efficient, dependable power is delivered by 25 hp totally enclosed fan-cooled motor in a large coal preparation plant. This Allis-Chalmers motor has "sealed interior" protection against dirt, moisture and corrosion. Cooling air does not touch interior windings. Write for Bulletin 51B6144.



**RIPL-FLO SCREENS** Reduce installation and maintenance expense with "Ripl-Flo" screens . . . used for screening egg, range, nut, stoker, and R.O.M. coal in lumps as large as 22 in. Sizes up to 6 x 16 ft. Bulletin 07B6151B.



**POWER DISTRIBUTION** Transformers of Allis-Chalmers design meet the exacting requirements of mining service. Bank of three, shown above, steps down voltage for mine power equipment and auxiliaries. Send for Bulletin 01R6186.



**CLOSE-COUPLED PUMPS** Motor and pump are combined into one unit in the SSUnit pump. Capacities 10-2,500 gpm; heads to 575 ft. Standard, enclosed fan-cooled, splash-proof or explosion-proof motors. Bulletin 52B6059D.

Low-Head, Texrope, Ripl-Flo, SSUnit are Allis-Chalmers Trademarks

## Builds for Coal!



# Cut your operating costs these 12 ways

— with COAL-FLO conveyor belts

**S**TOP that steady rise in your cost-per-ton. Here are bed-rock facts that speak for themselves. Facts proved by more than 20 years' experience in America's most progressive coal mines. Facts vouched for by cost-wise operators who have cut their operating expense in these 12 major cost items by installing Goodyear Coal-Flo conveyor belting to carry coal outby from face to tippie. Check them off, item by item, and figure how much you could save.

## COAL-FLO ECONOMIES

**1.** Coal-Flo conveyor haulage eliminates tracks and switches, bonding, heavy grading;

operates efficiently over pitches and rolls without jamming or mashing coal.

**2.** Cuts timbering cost 50%. The belt runs close to the rib, enabling you to use a single prop under the center of the roof load, insuring far greater safety, with much less lumber.

**3.** Up to 20% more lumps in low seams, due to a greater clearance between belt and roof, plus gentler handling.

**4.** No danger of runaways with peril to "hot-footers." Haulage injuries are virtually unknown.

## Let us show you proof — in color

With the willing help of several mines conveyorized with Goodyear Coal-Flo belting, we have just completed an historic color-sound picture that covers the evolution of the coal industry from creel to conveyor. In this motion picture you will see complete, visual proof of every saving mentioned in this advertisement. To see it at your own office, just call your nearest Goodyear Industrial Rubber Products Distributor — his name is in your classified telephone directory.



Timbering costs average about 50% less with Coal-Flo conveyors. The single prop under the roof-center gives greater support and security than two side timbers.



**5.** Far greater ton-per-hour capacity because haulage is continuous—there's no time lost for car spotting. Your cutters and loaders have no time out.

**6.** Greater fire and explosion safety through elimination of bare wires and charged coils, sparks and broken cables.

**7.** Far less brushing—you leave your gob inside even in low-seam coal because Coal-Flo belts require minimum head-room.

**8.** 50% to 75% lower power, maintenance and operating cost—you have no haulage crews with Coal-Flo belts.

**9.** Silent operation—you can hear a "working" roof.

**10.** Fewer roof-falls because of safer timbering and no operating vibration.

**11.** More uniform power demand—no

surges, no peaks and valleys as occur with intermittent haulage. Better voltage regulation.

**12.** Continuous, uniform, automatic delivery at the tipple—no dumping crew required.

### THIS IS VERY IMPORTANT:

To secure ALL these advantages over a long-time period it is essential that you specify Goodyear Coal-Flo belting. It is the only belting that is safeguarded against ALL forms of underground mildew—the greatest enemy of mine belting. That is proved by its records, running as high as 40 million tons in coal service.

Let the G.T.M.—Goodyear Technical Man—give you the factual dollars-and-cents story of many mines that have modernized with Coal-Flo conveyors. Write: Goodyear, Akron 16, Ohio or Los Angeles 54, California.

# GOODYEAR

THE GREATEST NAME IN RUBBER

Coal-Flo—T.M. The Goodyear Tire & Rubber Company



Goodyear Coal-Flo belts carry coal out by continuously. There's no stand-by time for spotting—no lost time for loaders.



Slope belt carries coal in continuous flow from underground belts or surge bin to tipple.

**HIT IT!**



HIT MARFAK hard with a hammer. Notice it doesn't splatter as ordinary grease would. Just so, Marfak in your bearings takes the pounding of rough service—won't jar out, won't squeeze out. Marfak lasts longer, requires fewer applications.

**STRETCH IT!**



SEE HOW MARFAK holds together even when s-t-r-e-t-c-h-e-d. Ordinary grease won't do this. Marfak's cohesiveness prevents it from working out of the bearing . . . assures lastingly effective lubrication, better protection, longer life for parts.

# 4 Ways to Prove

## MARFAK REDUCES BEARING MAINTENANCE COSTS

Tune in . . .  
TEXACO STAR THEATRE  
presents the  
TONY MARTIN SHOW  
every Sunday night.  
METROPOLITAN OPERA  
broadcasts  
every Saturday afternoon.

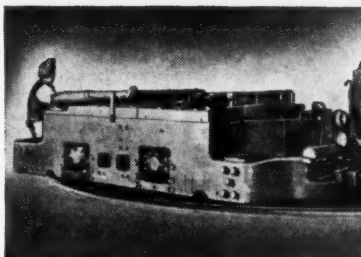


# TEXACO



A black and white photograph showing a person's hand holding a small, dark, irregularly shaped object, possibly a piece of wood or a small animal, against a light background. The object is being held between the thumb and index finger, with the rest of the hand visible in the background. The image is grainy and has a high-contrast, almost graphic quality.

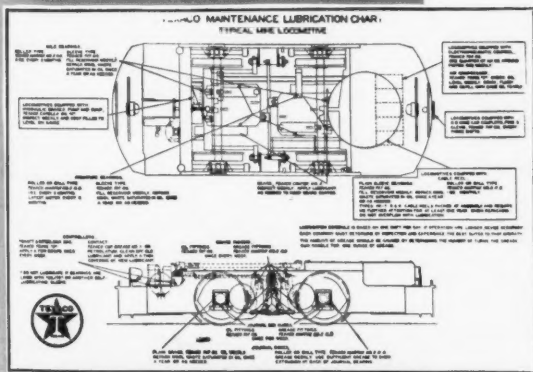
**USE IT!**



THE BEST PROOF that *Marfak* can reduce your costs for maintenance, repairs and parts replacements is to *use* it in your heavy-duty bearings—plain or anti-friction. Check your records before and after using *Marfak* and you'll find you've not only saved money but kept your equipment in service longer between overhauls. No wonder—MORE THAN 250 MILLION POUNDS OF MARFAK HAVE BEEN USED!

For high-speed, grease-lubricated ball and roller bearings in all types of mine machinery, use *Texaco Regal Starfak*. This fine lubricant assures longer bearing life, more efficient operation, lower maintenance costs.

For Texaco Products and Lubrication Engineering Service, call the nearest of the more than 2500 Texaco distributing plants in the 48 States, or write The Texas Company, *National Sales Division, Dept. C.*, 135 East 42nd Street, New York 17, N. Y.



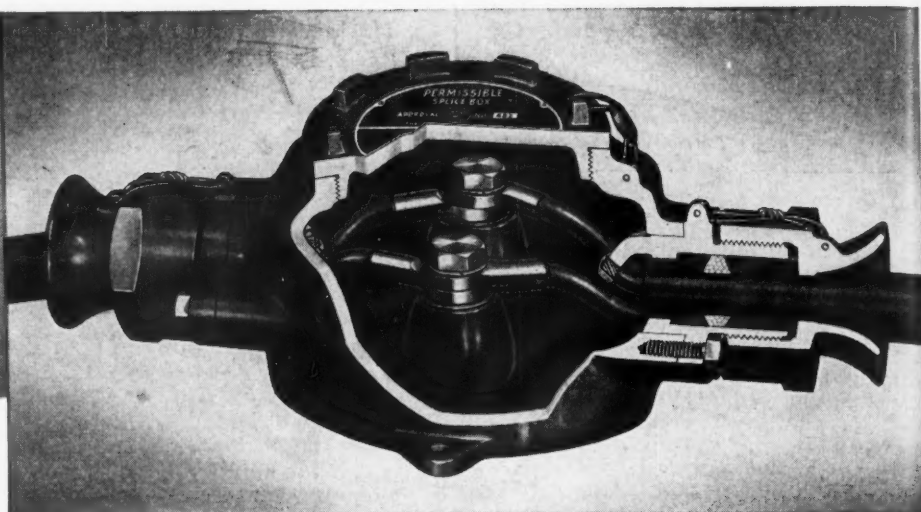
**-TEXACO MAINTENANCE LUBRICATION**  
RTS: Leading manufacturers of underground mining machinery approve Texaco products for use in conveyors, loaders, locomotives, etc., and have agreed in preparing these charts. Charts show exactly where and when to use the proper Texaco product. Write for the charts you need, stating name and model of each machine. No obligations.

# Lubricants

## FOR THE COAL MINING INDUSTRY



O-B Type-FG Permissible Splice Box — A safe, fool-proof device approved by the U. S. Bureau of Mines. Note the simple method of connecting cables. Only four cap screws need be tightened when extending cables.



## HOW TO GET *More Life*

Here is a good way to make your trailing cables last longer — simply sectionalize them by dividing long, continuous pieces into several shorter, easier-to-handle lengths. For average room work, trailing cables must measure several hundred feet or longer in order to reach from room neck to face when the room is nearly worked out. Instead of this entire length, sectionalized cables permit the use of shorter pieces when the room is only partially worked out. As work progresses beyond the limits of one piece, another length is connected as an extension.

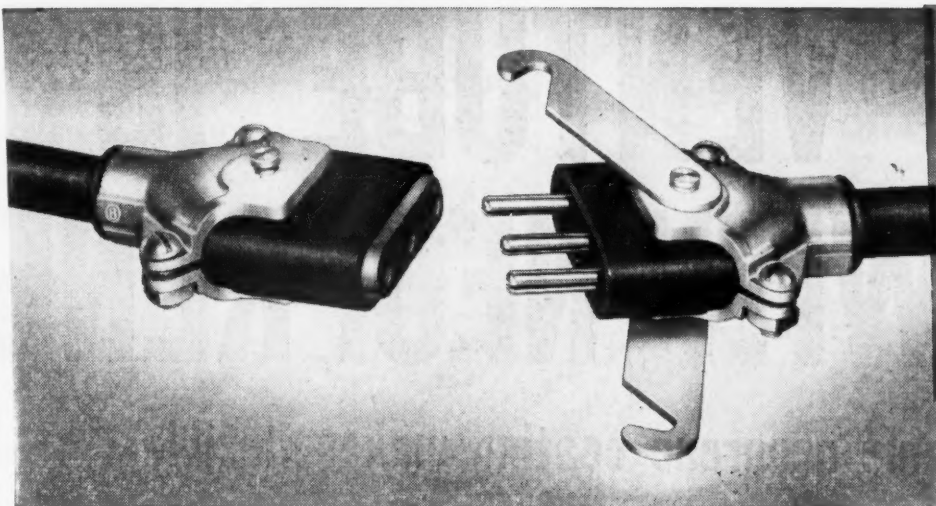
Trailing cable extensions can be made quickly and easily with O-B connective devices—the MechanoPlug for use in good air and the Type-FG Permissible Splice Box for gassy areas. Tested and approved by the U. S. Bureau of Mines, the Type-FG Box is contained within an explosion-proof case, yet its light weight permits convenient handling.

Study the many advantages of sectionalized cables listed on the next page. Then bring these benefits to your mine by sectionalizing all long trailing cables with an O-B connective device. Specifications and full information on both Splice Boxes and Mechano Plugs may be obtained upon request.

## INVESTIGATE

**1<sup>ST</sup>** Energized cable generates heat. When one long cable is used, a major portion of the cable must be wound on reels to keep it out of the road. Heat will have little chance to dissipate in a coil, being confined, instead, to the inner layers of the reel where it attacks the cable insulation. The rapid deterioration which sets in can be eliminated only by not winding the cable in a coil or on a reel.



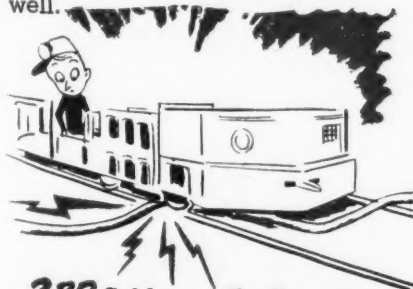


O-B Mechano Plug—as easy to use as plugging in your electric coffee maker. May be installed in the field without makeshift splicing or vulcanizing.

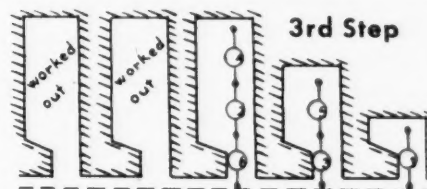
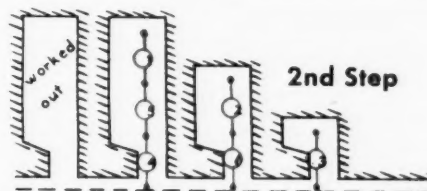
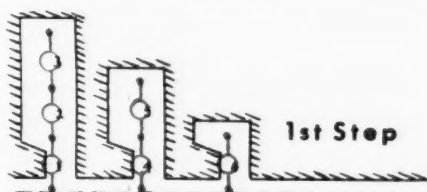
## FROM TRAILING CABLES

### THESE 5 REASONS WHY SECTIONALIZING SAVES CABLE—

**2<sup>ND</sup>** If cable is not wound on a reel and one continuous long piece is used, it must be stretched out on the bottom where it will be in the way of men and equipment and be subject to mechanical damage. The use of only as much cable as needed—sectionalized cable—would prevent this condition as well.



**3<sup>RD</sup>** Seldom will all sections in a room be using maximum cable simultaneously. If your cable is sectionalized, excess lengths may be transferred from room to room as they are needed, thus reducing the total amount of cable required to handle one operation.



Only six 100-foot lengths of cable—needed to handle three 300-foot rooms.

**4<sup>TH</sup>** Defective sections of cable can quickly be replaced and taken to the shop for repair under proper conditions. The ease of repair means your cables will be kept in better condition and less liable to burn-out. In addition, your machines need be out of service only a few minutes in case of cable damage.

**5<sup>TH</sup>** Smaller lengths of cable are easier to handle. Three hundred feet of No. 2 multiple-conductor cable weighs about 432 pounds. By sectionalizing the cable into three lengths, each section would weigh only 144 pounds. If you are using No. 1 cable, the difference is even greater—549 pounds in one piece, 183 pounds per 100-foot section.

# Ohio Brass

2792-M

# NOW "VENTUBE" IS MADE WITH NEOPRENE

**Tough, durable neoprene coating makes flexible ventilating duct even better than prewar type!**



- LIGHTER IN WEIGHT
- MORE FLEXIBILITY
- EASIER TO COUPLE
- STANDS UP TO ACID
- RESISTS HEAT, AGING

Every miner knows that neoprene, the Du Pont synthetic rubber, is tough and durable, giving unusual service in conveyor belts, cable jacketing and other mine equipment. Now, you'll be glad to know "Ventube"\* is made with neoprene. The "Ventube" fabric is thoroughly impregnated with a neoprene composition engineered to give long life and trouble-free service.

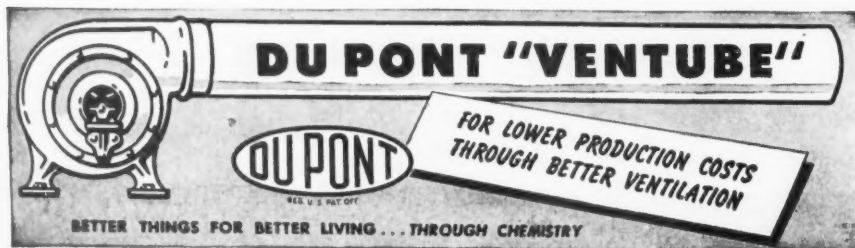
Many advantages of the new material: (1) Much more flexible for

carrying air around curves or corners, for coupling and uncoupling; (2) Much lighter in weight, for lifting and carrying long lengths; (3) Neoprene is long-lasting, withstands corrosive acid or alkali waters, resists oxidation from heat and aging. Not only better than wartime types, but even better than prewar "Ventube."

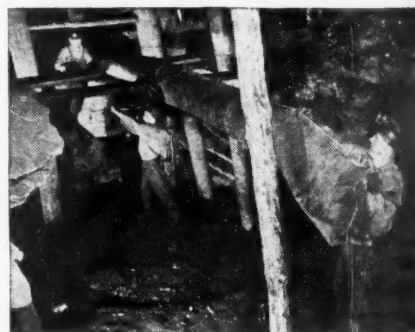
And remember that "Ventube," when attached to a motor-driven blower fan of adequate capacity, brings fresh air to men at work, clears the face quickly, reduces down-time after blast, speeds production. Easy to install, to move, to store. Low in both original and upkeep cost.

For further details, consult Du Pont Technical Service, Fabrics Div., E. I. du Pont de Nemours & Co. (Inc.), Fairfield, Conn.

\*"VENTUBE" is Du Pont's registered trade mark for its flexible, synthetic-rubberized ventilating duct.



"Ventube" made with neoprene is much lighter in weight, making it easy to store and handle.



The new-type "Ventube" is much more flexible for carrying around curves or corners, for quick coupling and uncoupling of sections.



Neoprene gives "Ventube" strong resistance to corrosive waters in mines, to oxidation from heat and aging.



# JOY

## BELT CONVEYORS

engineered for  
long life and  
low maintenance

Shift after shift, Joy Belt Conveyors move a steady stream of coal over any length or type of installation—room, gathering or haulage—with a maximum of efficiency and service. Lost time is reduced to a minimum by fine engineering based on years of practical "know-how!"

**RUGGEDLY BUILT...  
ECONOMICALLY  
OPERATED**



### JOY LOOP TAKE-UP

saves time when adjusting belt sections

There's less delay when you change the belt length of a Joy Belt Conveyor, for the loop enables you to do the job quickly and simply—just another reason for Joy superiority.

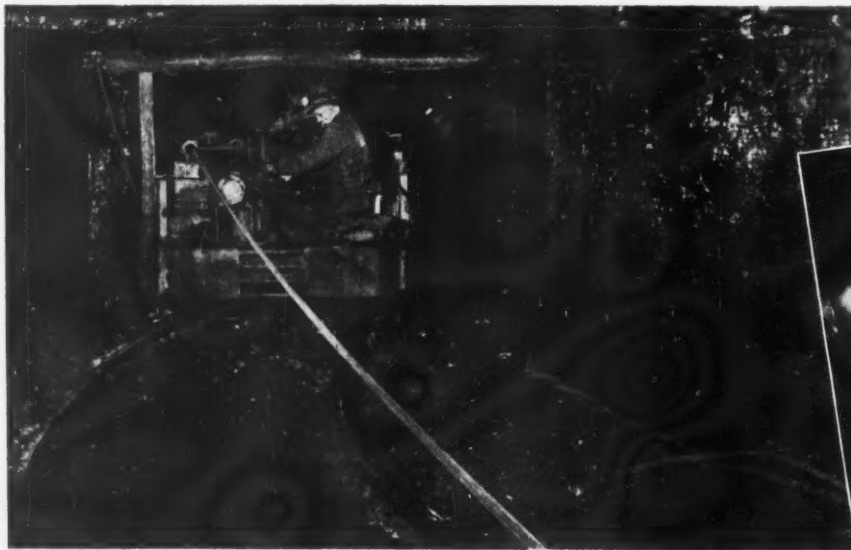
*consult  
Joy  
engineer*

W&O CL-1944

# JOY MANUFACTURING CO.

GENERAL OFFICES: HENRY W. OLIVER BUILDING • PITTSBURGH 22, PA.

# AMERCLAD ELECTRICAL WIRE



**FOR MINING**—U.S.S. Amerclad Mining Machine Cables with special ground wires assure maximum safety to workmen. Neoprene cover resists flame and bears approval of Pennsylvania Department of Mines.



**FOR PORTABLE TOOLS** — U.S.S. Amerclad with its Oil-Proof Neoprene cover gives unsurpassed all-round service for portable drills, saws, welders, sanders and other equipment. It withstands constant flexing and abrasion for extremely long periods.

## FOR HEAVY PORTABLE MACHINES

Shovels, dredges and heavy portable electrical equipment of all kinds need cable that can be dragged over rocks, immersed in water or splashed with oil. U.S.S. Amerclad has proved highly satisfactory in this service. "PS" Shielding and ground wires insure safe shock-proof cable.





# RE AND CABLE

*Now available  
in quantity!*

**Y**ou can now order the standard types of U·S·S Amerclad Rubber covered cable and get delivery from stock. Special types of cable, which have to be made to order, are also going through the mill faster as production catches up with demand. However, the quicker you place your order the quicker you'll get the cable.

We suggest that you call or write to the nearest office of the American Steel and Wire Company or its distributors. Our sales representatives can give you a straight forward answer as to the situation on any particular type of electrical wire or cable you need.

## AMERICAN STEEL & WIRE COMPANY

*Cleveland, Chicago and New York*

Columbia Steel Company, San Francisco, *Pacific Coast Distributors*  
Tennessee Coal, Iron & Railroad Company, Birmingham, *Southern Distributors*  
United States Steel Export Company, New York

## UNITED STATES STEEL

### Types of U·S·S Amerclad Cords and Cables

#### PORTABLE CORDS

*For heavy duty electrical tools such as drills, hammers, grinders, reamers, saws, pumps, etc.*

*For light duty use on washing machines, ironers, vacuum cleaners, fans, etc.*

*Oil-Proof Neoprene Cords.*

*Miners' Lamp Cord.*

*Shot Fire Cord.*

#### MINING CABLES

*Locomotive gathering cables—single conductor.*

*Mining machine cables:*

*Two-conductor, Round  
Two-conductor, Concentric  
Two-conductor, Twin Parallel  
Two-conductor, Twin Parallel with ground wire*

#### PORTABLE POWER CABLES

*Type SH-D—Three-conductor, Shielded*

*Type G—Three-conductor with ground wires  
Type W—Three-conductor  
Type W—Four-conductor*

#### MISCELLANEOUS

*Railway Utility Cables  
Trolley-Bus Cables  
Motor Lead Cables  
Welding Cables  
Grounding Cables  
Traveling Cables*



# U·S·S AMERCLAD CABLE



**NEW SUPERLA**  
MINE LUBRICANT NO. 0

**Cuts oil consumption  
here as much as 75%**

STAYS on the job far longer than regular motor oil in oil lubricated gear cases! Tests proved this about new Superla Mine Lubricant No. 0. In fact, in these tests—made on properly maintained loaders under actual mine operating conditions—the new lubricant lasted up to *four times* as long as the regular motor oil!

At the same time, it gave clean operation. After four months service with Superla No. 0, there were no carbon deposits in the gear cases, on clutch plates, in bearings, or on the sides of the gears.

Cleaner operation brings smoother clutch action and thus helps operators load faster. It saves time and labor through minimizing the need for cleaning gear cases and replacing worn parts. And remember, Superla No. 0 brings you these advantages on top of saving up to 75% in oil consumption.

A Standard Oil Lubrication Engineer will explain the proper use of Superla Mine Lubricant No. 0 that make it especially effective for loader lubrication. Write Standard Oil Company (Ind.), 910 South Michigan Avenue, Chicago 80, Illinois, for the Engineer nearest you.



**STANDARD OIL COMPANY (INDIANA)**

**STANDARD  
SERVICE**

lubr  
icant  
lers  
nt  
  
months  
in the  
years.  
thus he  
minizing  
s.  
es on

the prop  
effective  
010 Sou  
nearest



49-38

● The Jeffrey 29-U Coal Cutter is a Universal machine in every sense of the word. It cuts anywhere in the seam—top, center, bottom or shearing cuts. Can be furnished track-mounted, with crawlers or with pneumatic tires. Two positions of the bar are shown in these photos.

STANDARD  
SERVICE

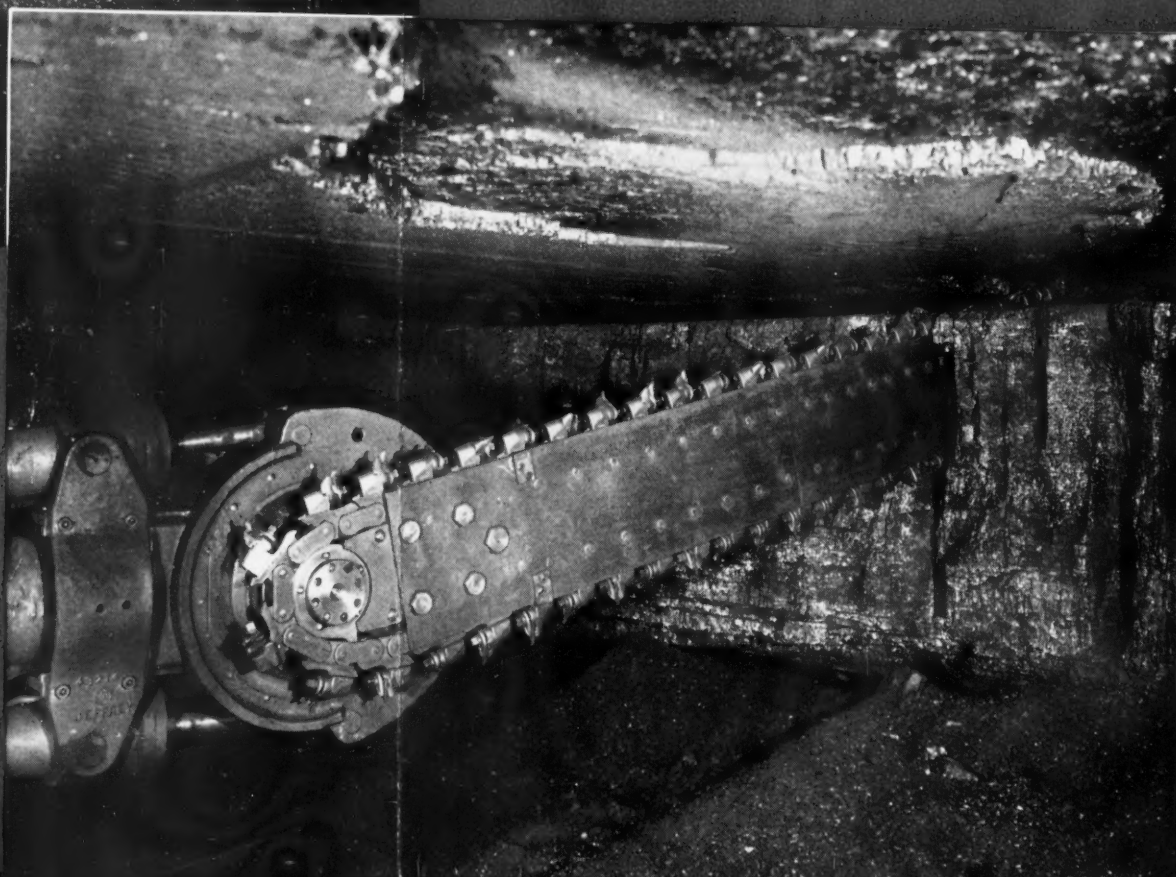




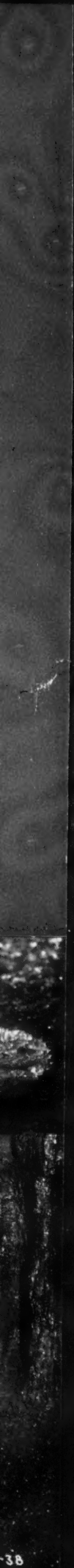
Reg. U. S. Pat. Off.

The Jeffrey trademark on equipment and replacement parts is the mark of mechanical efficiency and excellence. It is your guarantee of fine workmanship and fine performance. Look for it!

49-38











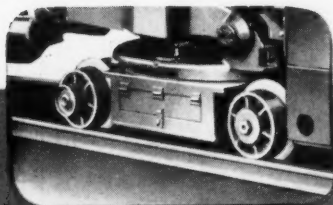
# Quality

## IS REFLECTED IN SERVICE OF JEFFREY UNIVERSAL CUTTERS

● One of the determining factors in the service you require from any Jeffrey Cutter is the quality of its built-in parts. Illustrated are two sturdy assemblies which perform important functions in the operation of Jeffrey 29-U Universal coal cutting machines.

This sturdy construction is the result of many years experience in designing, building and developing cutting machines to give maximum production under varying conditions at lowest possible cost. Even in rough going, to which these machines are constantly subjected, there are many assemblies which require close tolerances.

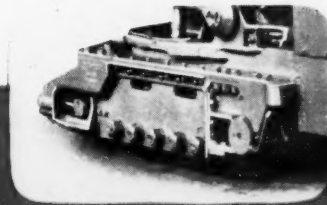
Jeffrey has the experience, the manufacturing knowledge and plant facilities to meet required tolerances and still build rugged equipment. This has been proved in a host of mines where Jeffrey cutters have been "on the job" for ten, fifteen and twenty years and are still going strong.



TRACK MOUNTED

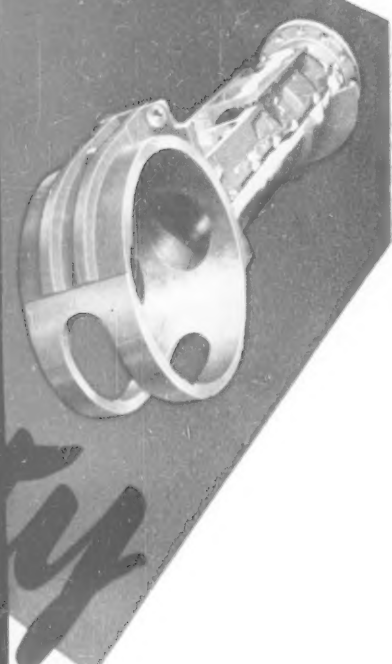


WITH PNEUMATIC TIRES



CRAWLER MOUNTED





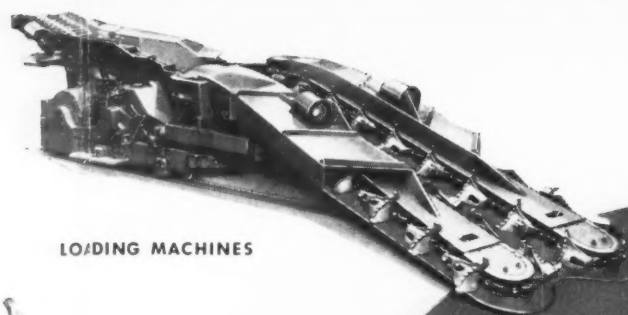
## CE OF CUTTERS

struction is the result of  
ence in designing, build-  
ng cutting machines to  
roduction under varying  
st possible cost. Even in  
hich these machines are  
ed, there are many as-  
quire close tolerances.

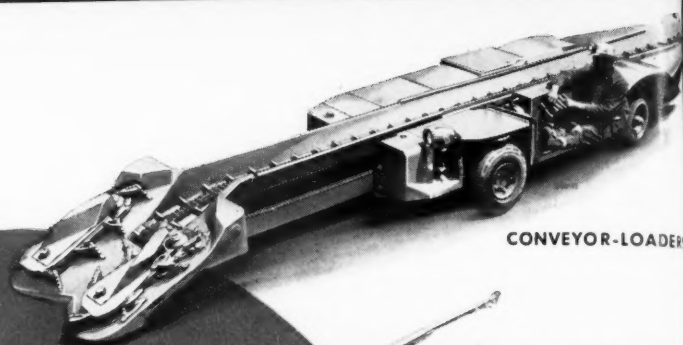
ledge and plant  
equipment. This  
tters have been  
ill going strong.



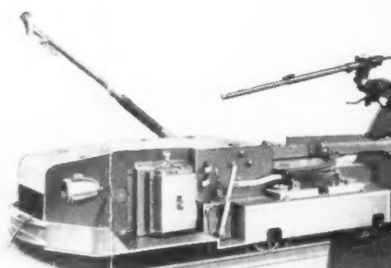
CRAWLER MOUNTED



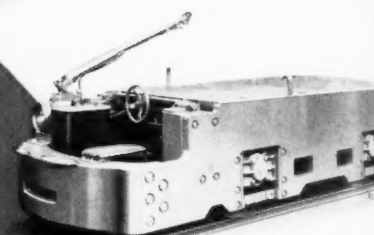
LOADING MACHINES



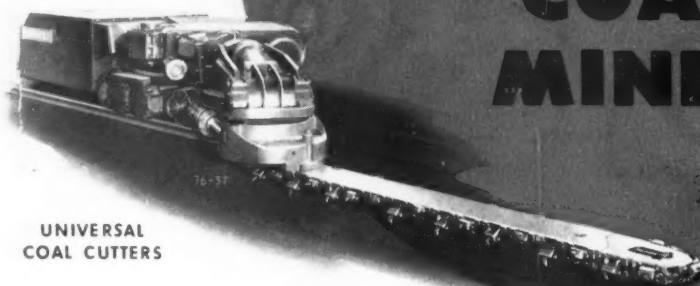
CONVEYOR-LOADER



DRILLS AND  
DRILLING MACHINES



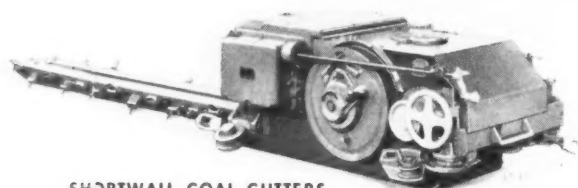
TROLLEY AND STORAGE  
BATTERY LOCOMOTIVE



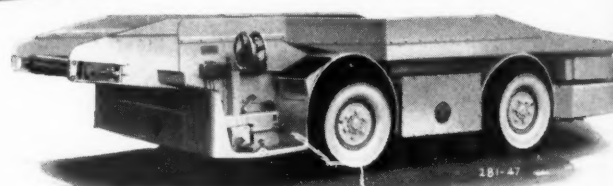
UNIVERSAL  
COAL CUTTERS



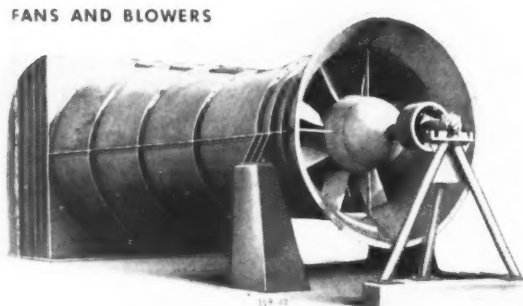
SHORTWALLOADERS



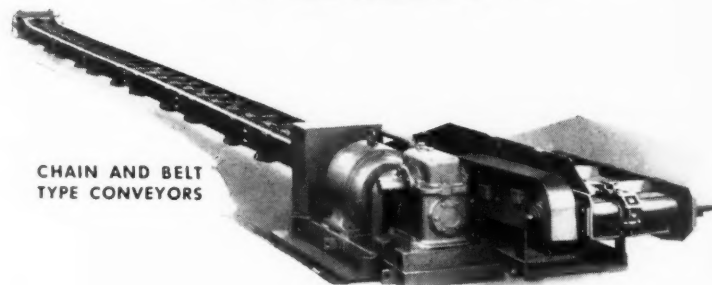
SHORTWALL COAL CUTTERS



SHUTTLE CARS



FANS AND BLOWERS



CHAIN AND BELT  
TYPE CONVEYORS

**AND GENUINE RENEWAL PARTS**

# THE JEFFREY MANUFACTURING COMPANY

*Established in 1877*

912-99 NORTH FOURTH STREET, COLUMBUS 16, OHIO

### Sales Offices:

Baltimore  
Birmingham  
Boston  
Buffalo

Chicago  
Cleveland  
Cincinnati  
Detroit

Denver  
Harlan  
Houston  
Huntington

Jacksonville  
Milwaukee  
New York  
Philadelphia

Pittsburgh  
Scranton  
St. Louis  
Salt Lake City

### Service Stations:

Pittsburgh  
Harlan, Ky.

Birmingham  
St. Louis

Logan-Beckley  
W. Va.

Scranton

### Foreign Plants:

Jeffrey Mfg. Co., Ltd.  
Montreal, Quebec

British Jeffrey-Diamond Ltd.  
Wakefield, England

Jeffrey-Galion (Pty), Ltd.  
Johannesburg, S. A.

**90% OF ALL V-BELT DRIVE PROBLEMS  
SOLVED ECONOMICALLY WITH TEXROPE**

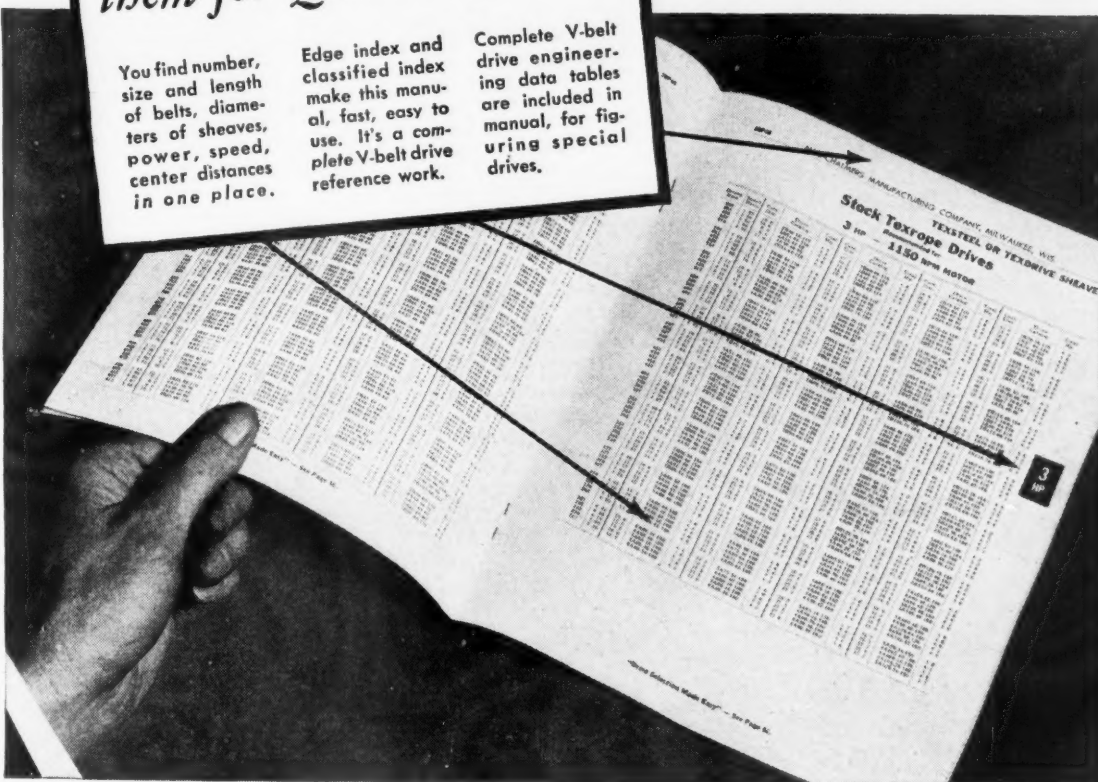
# Pre-Engineered Drives

*This New Manual Lists  
them for Quick Reference*

You find number,  
size and length  
of belts, diame-  
ters of sheaves,  
power, speed,  
center distances  
in one place.

Edge index and  
classified index  
make this manu-  
al, fast, easy to  
use. It's a com-  
plete V-belt drive  
reference work.

Complete V-belt  
drive engineer-  
ing data tables  
are included in  
manual, for fig-  
uring special  
drives.



**USING STOCK BELTS AND SHEAVES,** Texrope engineers have selected the *best* drive for each requirement . . . the drive most economical in first cost and in maintenance.

Only Allis-Chalmers offers you this complete Pre-Engineered drive manual. It is the product of 23 years of industrial V-belt drive experience, the

finest engineering talent in the business.

Here is a book that will save you time and money in the purchase of V-belt drive equipment. Copies have been sent to many Texrope users and dealers. If you don't have a copy yet, write for Texbook No. 20P40. ALLIS-CHALMERS, MILWAUKEE 1, WIS.

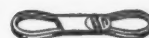
A 2335

Texrope, Super-7, Texsteel, Texdrive, Magic-Grip and Vari-Pitch are Allis-Chalmers Trademarks

# ALLIS-CHALMERS

**One of the Big 3 in Electric Power Equipment — Biggest of All in Range of Industrial Products**

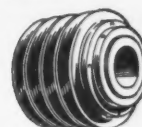
**TEXROPE**  
.. Greatest  
Name in  
V-Belt Drives



"Super 7" V-BELTS  
Five Types — Sizes  
to suit every power  
transmission job.



Texsteel, Texdrive,  
"Magic-Grip"  
— sheaves in a full  
range of sizes,  
grooves.



"Vari-Pitch"  
SHEAVES

Exact variations in  
speed, stationery or  
motion control.



**SPEED  
CHANGERS**

Speed variations up  
to 375% at the turn  
of a crank.

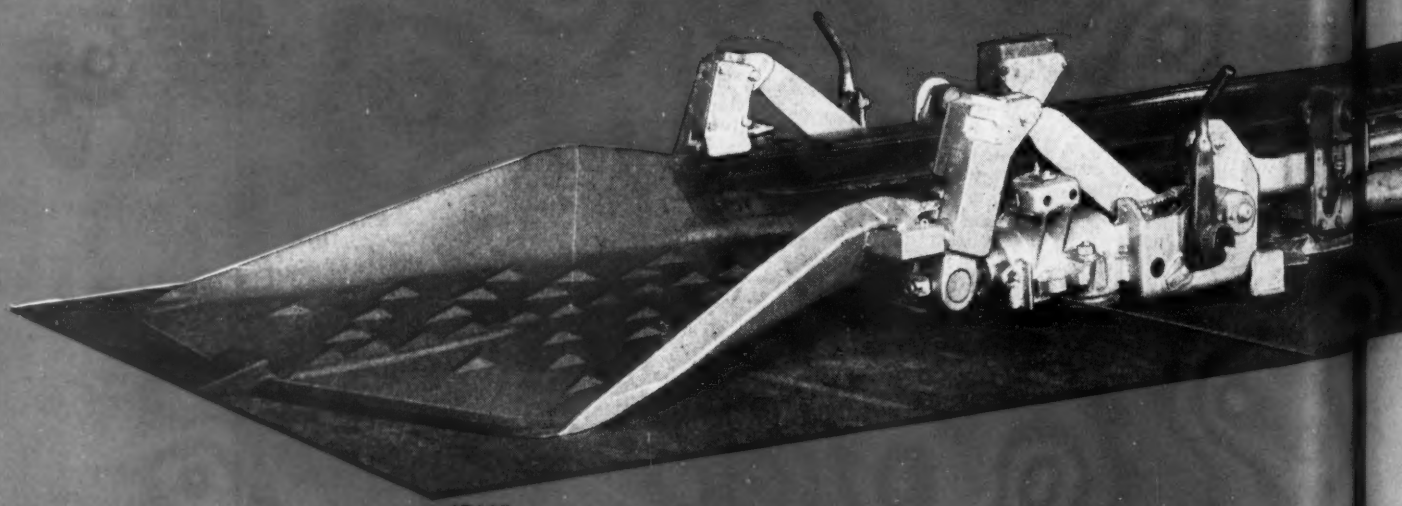


**ENGINEERING**  
Finest V-Belt engi-  
neering talent in the  
world—at your call.

TEXROPE "Super 7" V-Belts result from the cooperative research of two great companies — Allis-Chalmers and B. F. Goodrich. They are sold only by A-C.



# THE GOODMAN POWER DUCKBILL . . .

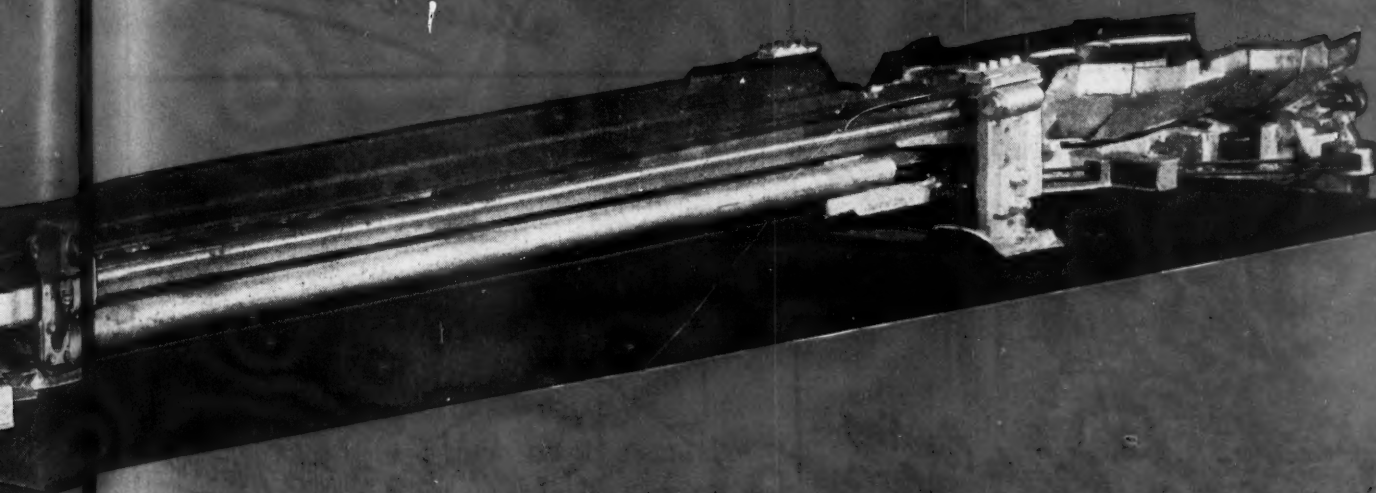


17007

## GOODMAN MANUFACTURING COMPANY



## All Movements Power Controlled

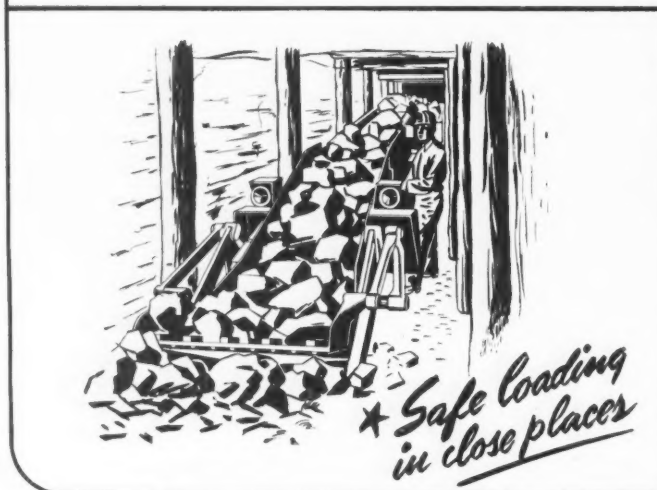
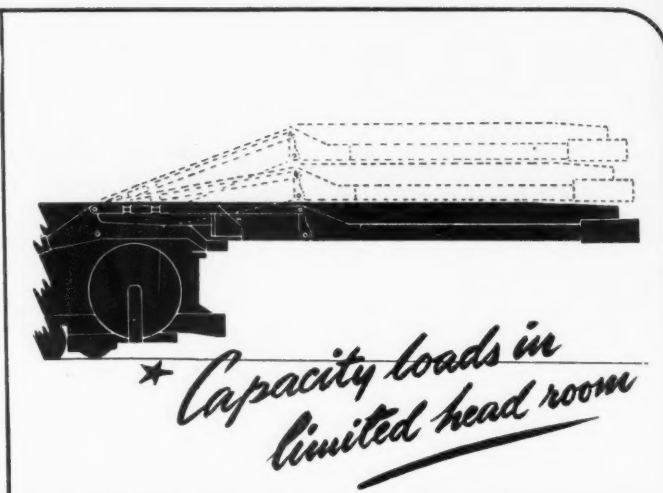
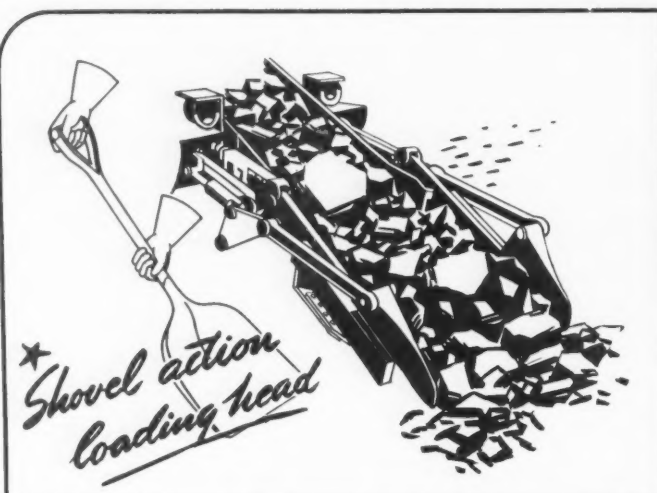


... loads at the face and discharges into cars or onto belt at the room neck; there is no track in the room. With an 8 foot depth cut, 40 foot rooms can be advanced 300 feet in 6 days—double shift, in 3 to 4 days—triple shift.

By working the room out quickly a minimum of top trouble is experienced. Large tonnages are secured from concentrated areas.

WALSTED STREET AT 48TH • CHICAGO 9, ILLINOIS

# You Get all FOUR With the Whaley "Automat"



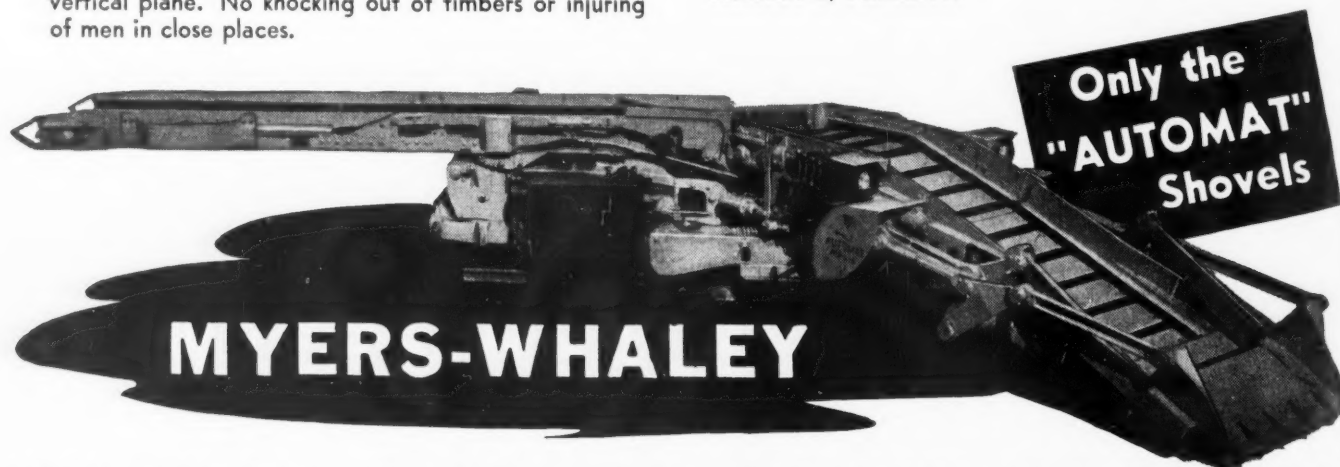
★ **SHOVEL ACTION LOADING HEAD** . . . The "Automat's" smooth shovel action, at 45 to 50 strokes per minute, is a simple, natural, vertical lift and pulling operation. No dragging or crushing of coal.

★ **CAPACITY LOADS IN LIMITED HEAD ROOM** . . . Our parallel lift rear conveyor is always parallel to top of car and loads cars in limited head room to full capacity.

★ **SAFETY** . . . Sudden sidekicking of machine or any part of it is never experienced with the "Automat" because the shoveling action of loading head is in a vertical plane. No knocking out of timbers or injuring of men in close places.

★ **POWER SAVINGS** . . . With one motor of 25 H.P., loading at 3 to 7 tons per minute, power consumption is only 1/5 K.W.H. per ton . . . the lowest power requirement of any loader of equal capacity.

These are four important considerations for any operator who is interested in maximum efficiency in every phase of mechanical loading, whether the material be coal, rock or slate. And remember, the "Automat" loads, in its stride, any lump of coal that will pass through your tippie . . . any lump of rock your cars, aerial tram or larries can take. Myers-Whaley Co., Knoxville 6, Tennessee.



**MECHANICAL LOADERS EXCLUSIVELY FOR OVER 39 YEARS**

# Simplex-TIREX

CORDS AND CABLES

*"Cured in Lead"*

SIMPLEX-TIREX

SELENIUM NEOPRENE ARMOR

**M**ORE than twenty-five years ago Simplex-TIREX was developed to bring you a cord or cable that was superior to anything then on the market. The big feature at that time was the fact that TIREX was cured in lead. In the intervening years, every foot of TIREX cords or cables has been cured in lead.

This process, while it is more expensive, gives you a cord or cable that is so superior in appearance and in service life that we feel, and service records prove, that Simplex-TIREX cords with the famous TIREX Selenium-Neoprene Armor are the most wear-resistant port-

able cords and cables on the market today.

In addition to the continuous use of the "cured-in-lead" process, TIREX cords and cables have been constantly improved. Their wear resistance has been increased and the use of neoprene for the jacket has resulted in greater resistance to oil, flame, acids, alkalies, heat and sunlight. In other words, TIREX cords and cables are constantly made better to give you a cord that will stand up longer in difficult service.

When you need portable cords or cables, be sure you specify **and get** the ones marked "Simplex-TIREX".

*Simplex*

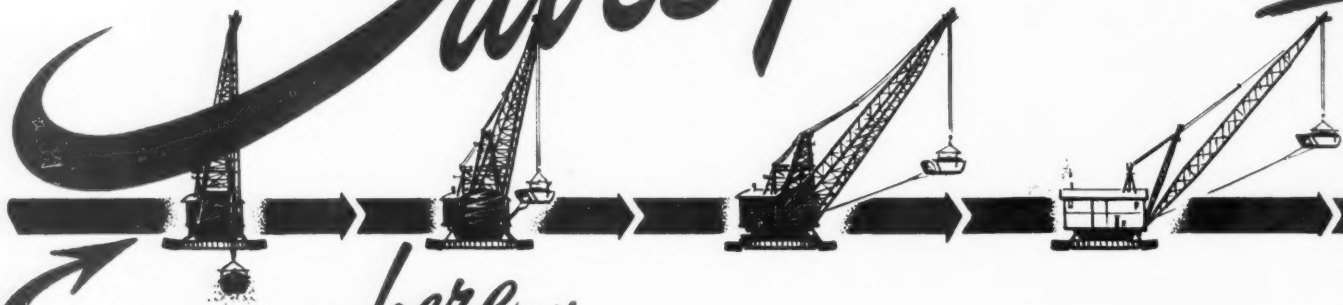
**WIRES & CABLES**

**SIMPLEX WIRE & CABLE CO., 79 SIDNEY ST., CAMBRIDGE 39, MASS.**

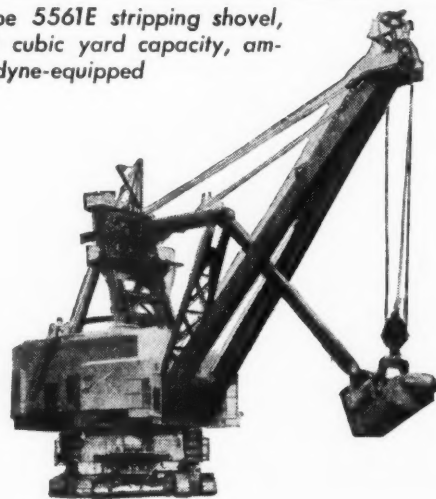


# *Saves precious*

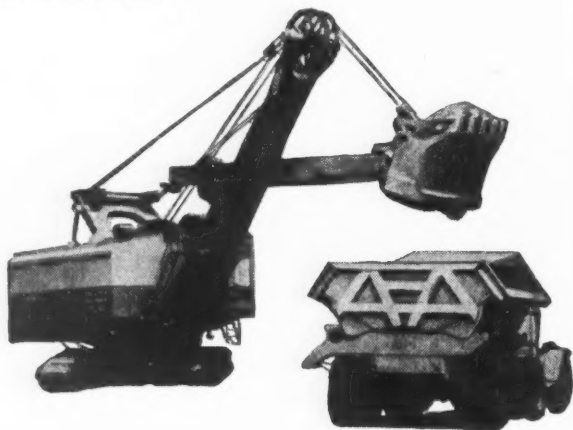
*between here...*



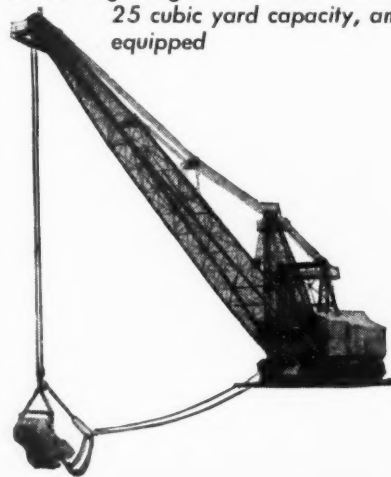
Type 1050B stripping shovel,  
33 cubic yard capacity, am-  
plidyne-equipped



Type 5561E stripping shovel,  
35 cubic yard capacity, am-  
plidyne-equipped

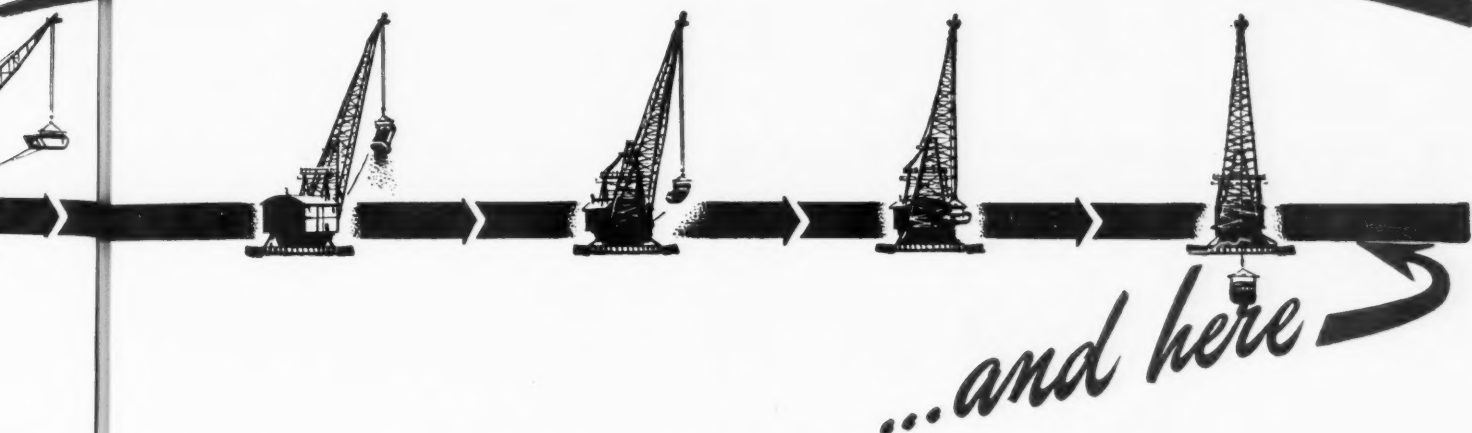


Type 151M loading shovel, 6 cubic yard capacity, am-  
plidyne-equipped



Type 1150B walking dragline for anthracite stripping,  
25 cubic yard capacity, amplidyne-  
equipped

# s Seconds...



...and here

**G-E Amplidyne control for electric excavators gives you faster cycles — greater tonnage per machine — lower stripping costs!**

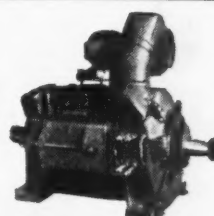
It happens whenever an electrified shovel or dragline comes on to a stripping. Yardage records are broken—overall costs go down. A large part of the credit must go to the General Electric Amplidyne—heart of the control system that has helped in no small way to make coal stripping a profitable operation. The reasons?

**FIRST**—Amplidyne control gives your operator a swifter, surer touch. Motors respond almost instantly to his signals. Fast acceleration and deceleration cuts precious seconds off hoist, swing, and crowd (or drag) motions. Operating cycles are shorter, daily tonnage handled is higher.

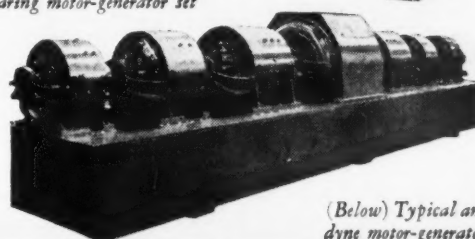
**SECOND**—Equipment downtime is smaller because stress on pinions and front-end strain is kept to a minimum. The Amplidyne acts as a regulator and even at high speeds, prevents the excessive current and torque peaks which damage electrical and mechanical machinery.

**THIRD**—Amplidyne is basically simple. Fewer control devices are used in an Amplidyne control system. They need less maintenance—require less space—stay on the job longer. General Electric has equipped more than 2000 shovels and draglines with electric drive. For the past five years, the modern Amplidyne control has been a feature of nearly all large shovels and draglines equipped by General Electric. Without exception, owners of these electrified excavators have benefited from smoother, faster operation and greater shovel capacity per day. When you specify electrical equipment for your next shovel, make sure it is Amplidyne-equipped. Simply get in touch with your nearest General Electric field office for information and assistance. *Apparatus Dept., General Electric Co., Schenectady 5, N. Y.*

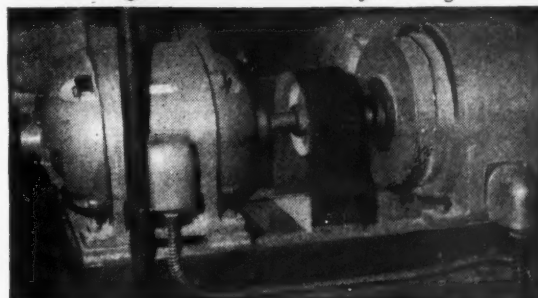
(Right) Type MDP mill motors provide great mechanical strength coupled with improved electrical characteristics



(Below) 7-unit a-c to d-c ball-bearing motor-generator set

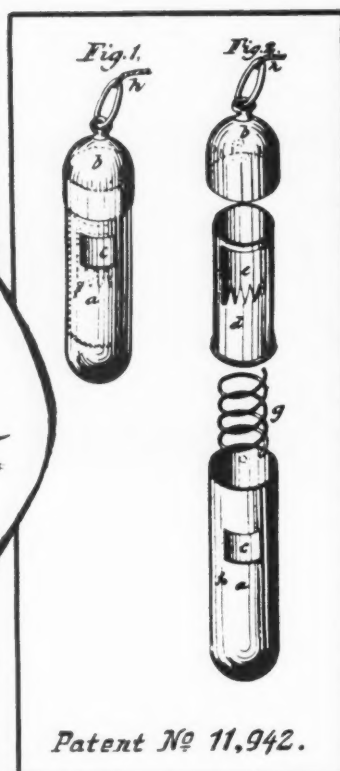


(Below) Typical amplidyne motor-generator set



# GENERAL ELECTRIC

# What Could Be More Useful and Practical?



## FAMOUS U. S. ISSUED PATENTS NO. 9 OF A SERIES **TAPEWORM-TRAP**

No. 11,941

Patented Nov. 14, 1854

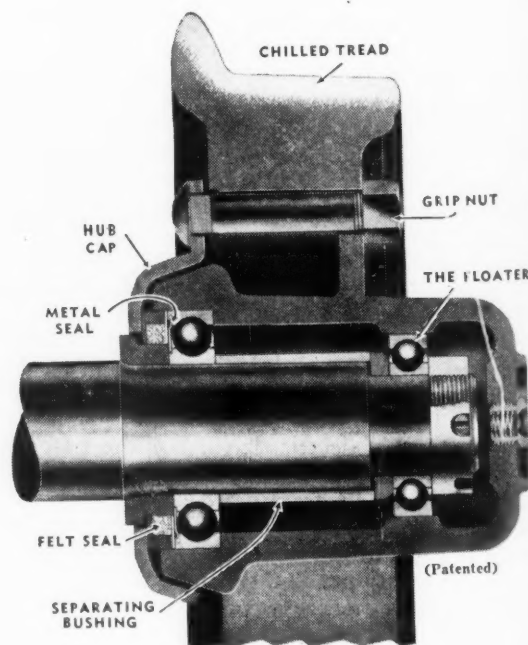
"... The object of my invention is to effect the removal of worms from the system, without employing medicines, and thereby causing much injury.

"My invention consists in a trap which is baited, attached to a string and swallowed by the patient after a fast of suitable duration to make the worm hungry. The worm seizes the bait, and its head is caught in the trap, which is then withdrawn from the patient's stomach by the string which has been left hanging from the mouth, dragging after it the whole length of the worm..."

(Language inside quote marks taken directly from U. S. Patent)

## S-D "FLOATER" WHEELS . . . THEY HATE TO BE GREASED!

The famous S-D "Floater" Wheel is a dandy. It hates to be greased . . . it got that reputation because you only have to grease it once every five years. It runs so easily you will think your cars are floating. You actually increase the maximum load hauled by a locomotive approximately 50%. This results in big savings in power. S-D "Floater" Wheels are guaranteed against breakage or bearing failure for five years. S-D "Floater" . . . the *truly demountable* wheel!



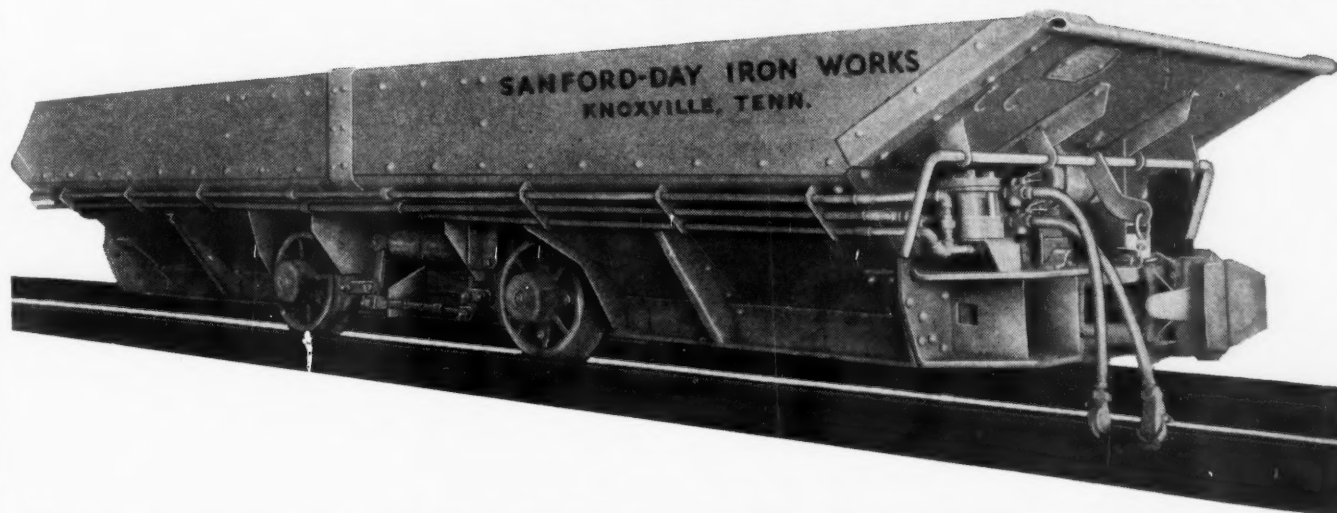
*20 Car loads of "Automatics" from -*



**SANFORD-DAY IRON WORKS, Inc. • Knoxville 9, Tenn.**



# There Are No Tapeworms in Our S-D "Automatics"



Having tapeworms is better than having a mine full of obsolete cars. No "tapeworms", that eat up your profits or slow down production, can be found in our big S-D "Automatics". Quite the reverse!

S-D "Automatics" are made as big as you want 'em . . . 4 and 8 wheel models from 1 to 40 ton capacity. They last much longer. You don't have to bang them around, uncouple them, stand them on end or roll them over when unloading. Just haul them over the bin and they automatically dump the coal . . . those doors lay the coal down gently in 1-2-3 order with a minimum of breakage and in many installations at a rate of better than 50 tons a minute.

A new tripping device—our jerk-out type—engages the latch hooks from underneath the cars and does away completely with the old-fashioned sidewise-extending latch lever bar that was a trouble-maker. Both ends of the car are now clean and free of complications.

If you're tired of having Tapeworm-Cars in your mine but don't feel like putting cash into a lot of new cars, you can LEASE S-D "Automatics" at an average of less than 2 cents per ton of coal handled over a fifteen year period. Purchase option price reduces after each lease payment. For complete information on this liberal plan, call, write or wire us today.

Shown above is the 6 ton S-D Overlapping end "Automatic". It is equipped with S-D "Float-er" Wheels, Westinghouse Air-brakes and Willison automatic couplers. Up at Black Star Coal Company they pull 15 of them, or 90 tons of coal, per trip.

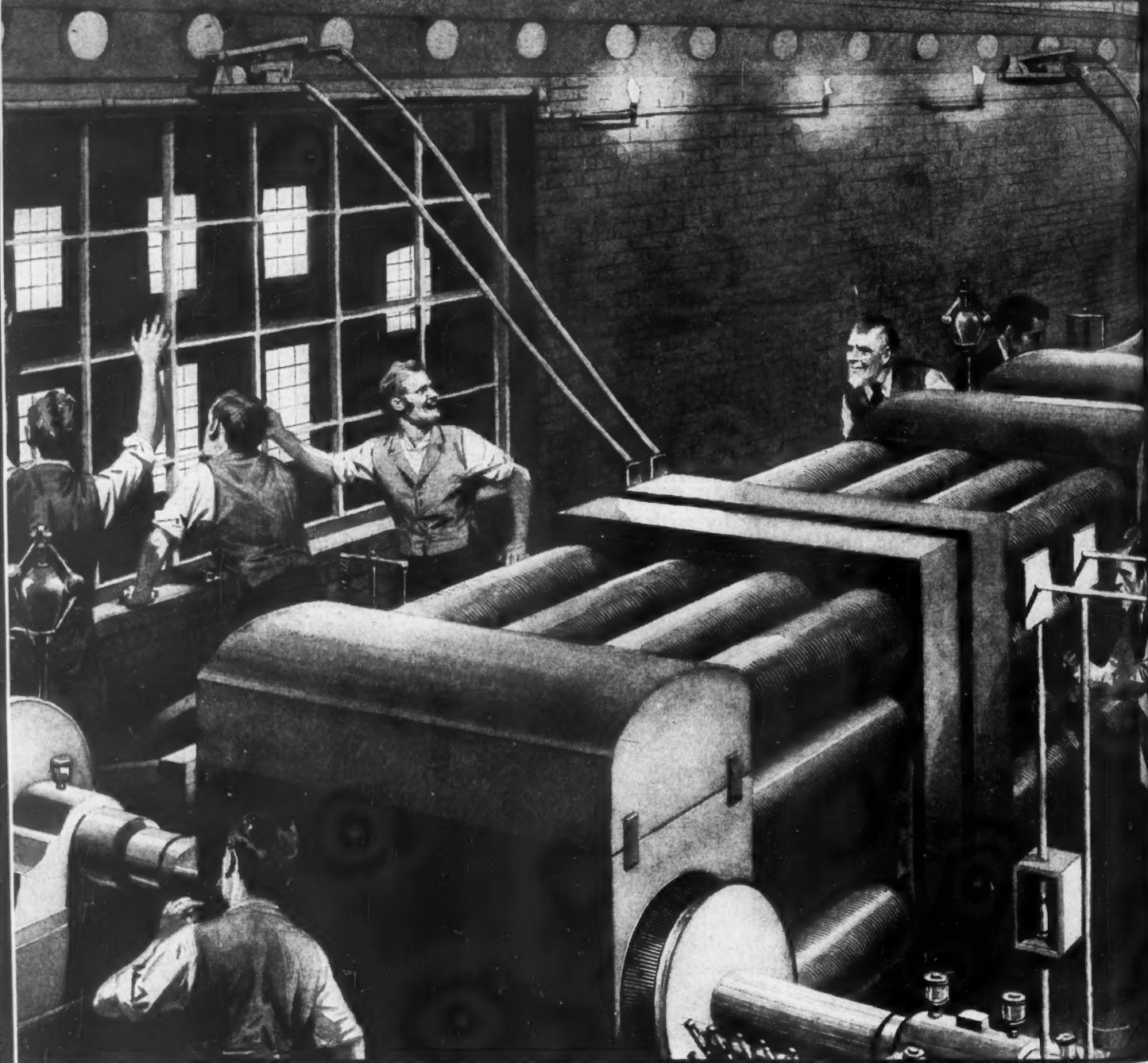
Notice in picture at right how the overlapping end of this car permits continuous loading by conveyor belt without stopping conveyor or cars, and without any spillage of coal. It's another tribute to practical S-D Engineering Skill.



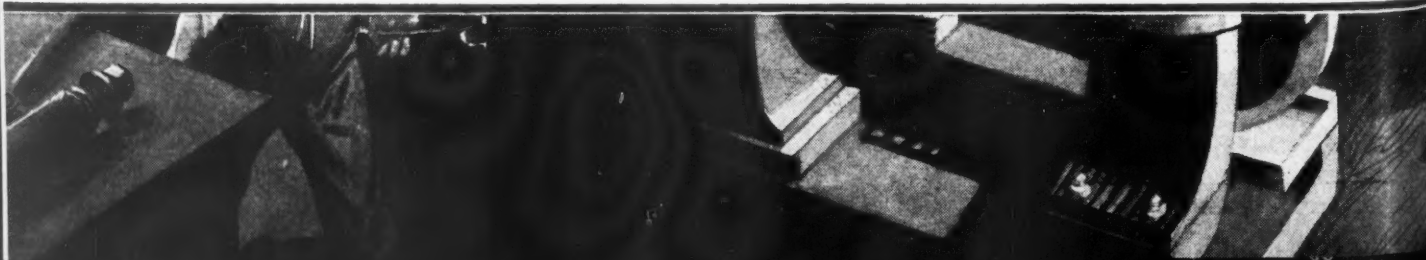
*20 Car loads of "Automatics" from -*

**SANFORD-DAY IRON WORKS, Inc. • Knoxville 9, Tenn.**

# CONFIDENCE...

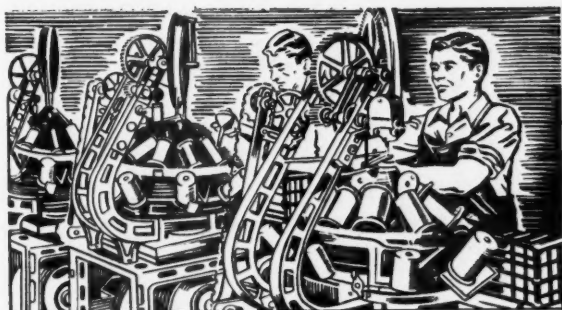


Manufacturers of Wire Rope and Strand • Fittings • Slings • Screen, Hardware and Industrial Wire Cloth • Aerial Wire Rope Systems  
Hard, Annealed or Tempered High and Low Carbon Fine and Specialty Wire, Flat Wire, Cold Rolled Strip and Cold Rolled Spring Steel • Ski Lifts





# .....how much is it worth?



IN 1880, when electric lights first were tried on New York's Broadway, Roebling's confidence in the future of electricity motivated a new Roebling undertaking... the manufacture of electrical wire and cable.

Roebling's contribution to this great industry during the past sixty-seven years is a matter of record. Its leadership was attained and is being maintained by rigid high standards of quality... tireless development of superior products, better processes, and more efficient methods.

Your confidence in Roebling is valued by every Roebling employee. His income depends upon his ability to preserve that confidence. Every Roebling employee knows that you will continue to prefer the output of his hands only if he produces better products and gives you better service.

Your Confidence in Roebling is Roebling's best salesman.

This applies, not only to electrical wire and cable, but to all Roebling products.

## WIRE ROPE ... ONE OF THE FIRST

WIRE ROPE, the first product manufactured by Roebling, plays an important part in every industry. Its economical use depends upon its proper application, and hundreds of men in your industry have found a cooperative and helpful friend to lend a hand when they were puzzled with wire rope problems. He is their Roebling Field Man.

They find that he really knows wire rope and its applications, yet never hesitates to call on the Roebling Engineers and the Roebling Development and Testing Laboratory.

We, here in Trenton, are constantly being reminded by grateful customers of the ability and integrity of their Roebling Field Man... of his honest and successful efforts to prove that the words "Confidence" and "Roebling" are one and the same.

At the right is a listing through which your nearest Roebling Field Man can be contacted. Why not call or write him today? Make an appointment to meet a friend who can save you both time and money on your wire rope installations.

### JOHN A. ROEBLING'S SONS COMPANY

TRENTON 2, NEW JERSEY

Branches and Warehouses in Principal Cities



Atlanta	934 Avon Avenue ... Raymond 2151
Boston	51 Sleeper Street ... Lib. 4373
Chicago	5525 W. Roosevelt Rd. ... Crawford 6400
Cleveland	701 St. Clair Ave., N.E. ... L.D. 249 & Main 5030
Denver	1635 Seventeenth St. ... East 2684 & Keystone 4111
Houston	6216 Navigation Blvd. ... Woodcrest 6-8316
Los Angeles	216 S. Alameda St. ... Trinity 1261
New York	19 Rector Street Wh. 3-5200
Philadelphia	12 S. 12th Street ... Market 7-2751
Pittsburgh	855 W. North Avenue ... Fairfax 2766
Portland, Ore.	1032 N. W. 14th Avenue ... Broadway 5456
San Francisco	1740 17th Street ... Market 8787
Seattle	900 First Avenue, South ... Main 4992

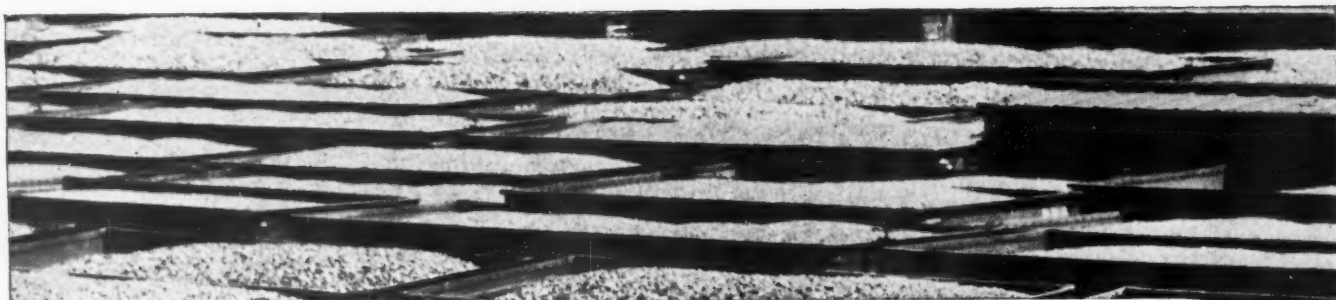
Electrical Wire and Cable • Suspension Bridges and Cables  
Aircord, Aircord Terminals and Air Controls • Lawn Mowers

# ROEBLING

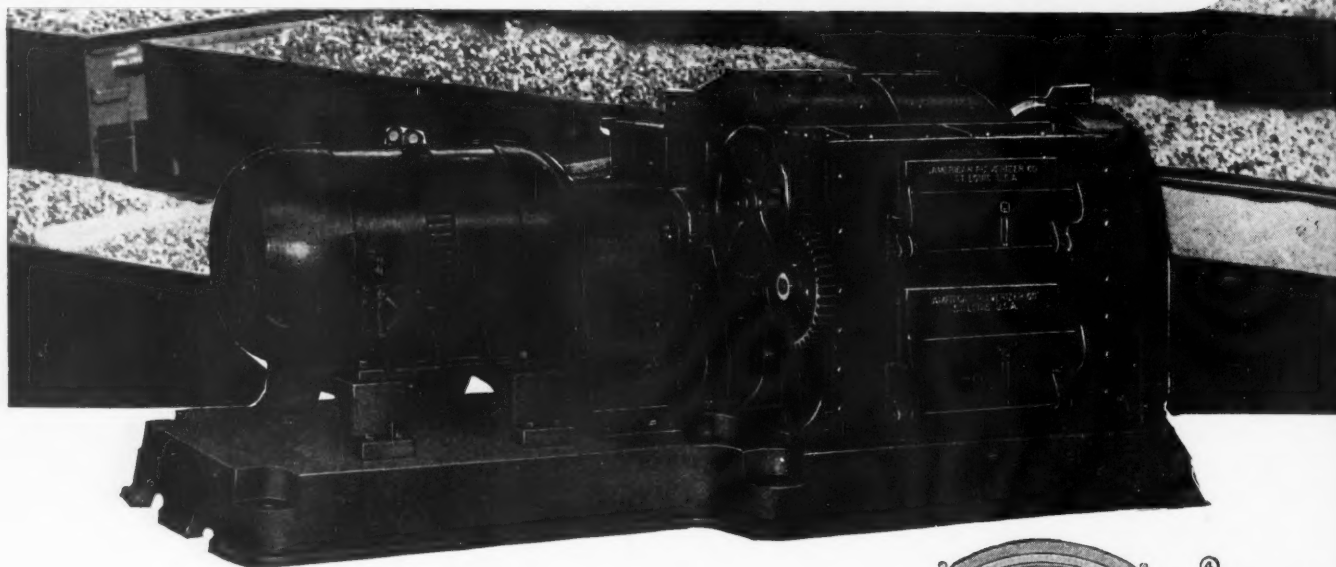
A CENTURY OF CONFIDENCE



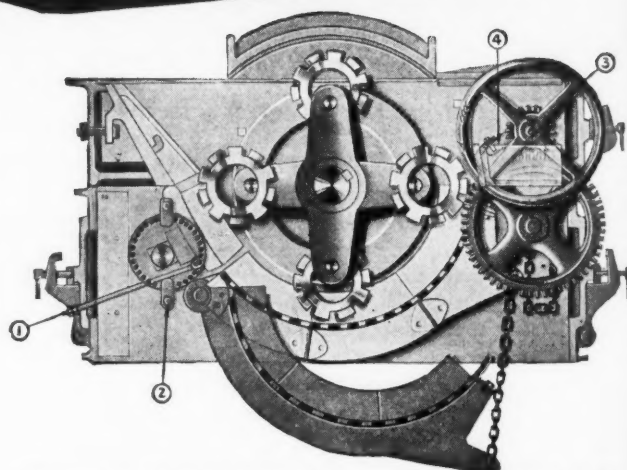




For high tonnage output of uniform, marketable sizes  
**AMERICAN** ROLLING  
MILL **CRUSHERS**



Readily marketable stoker and pulverizer sizes are profitably produced in American Rolling Ring Crushers. Through the splitting action of the patented shredder rings revolving at slower speeds, sizing is held uniform in high tonnage production with a minimum of undesirable fines. Americans are doubly adjustable for great flexibility of sizing to meet seasonal requirements and market conditions. Americans are available in a wide choice of types and sizes to exactly suit your operation . . . capacities from 50 to 500 TPH.



Cross sectional view shows double adjustability and the manner in which the shredder rings, revolving free on individual shafts, can deflect from tramp iron to give uninterrupted production and protect the crusher from injury. An easily cleaned metal trap catches and holds tramp iron.

Send for "AC" Bulletin on coal crushing data and crusher specifications

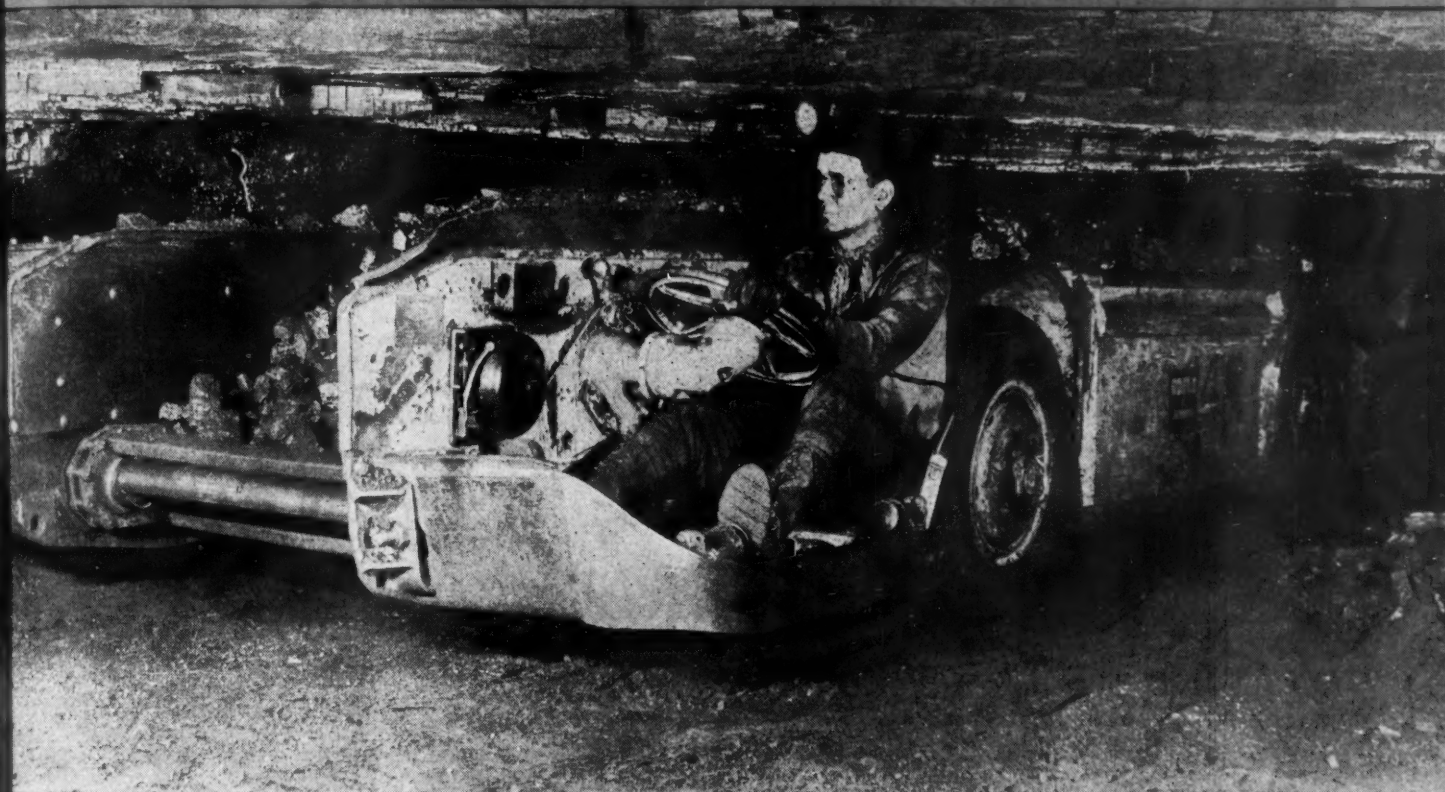
**American**

*Originators and Manufacturers of  
Ring Crushers and Pulverizers*

**PULVERIZER COMPANY**

1119 Macklind Avenue  
St. Louis 10, Mo.

**INCREASES TONNAGE...  
LOWERS PRODUCTION COSTS!**



# JOY SHUTTLE CARS



42" Shuttle Car for medium seams. Capacity approximately 5 tons.



Joy 60" Shuttle Car for seams six feet or more high. Capacity 5 to 10 tons.

Your production will swing upward and your costs will go down with Joy Shuttle Cars speeding the movement of coal from the face to conveyor or mine car. Models for high and low seams!

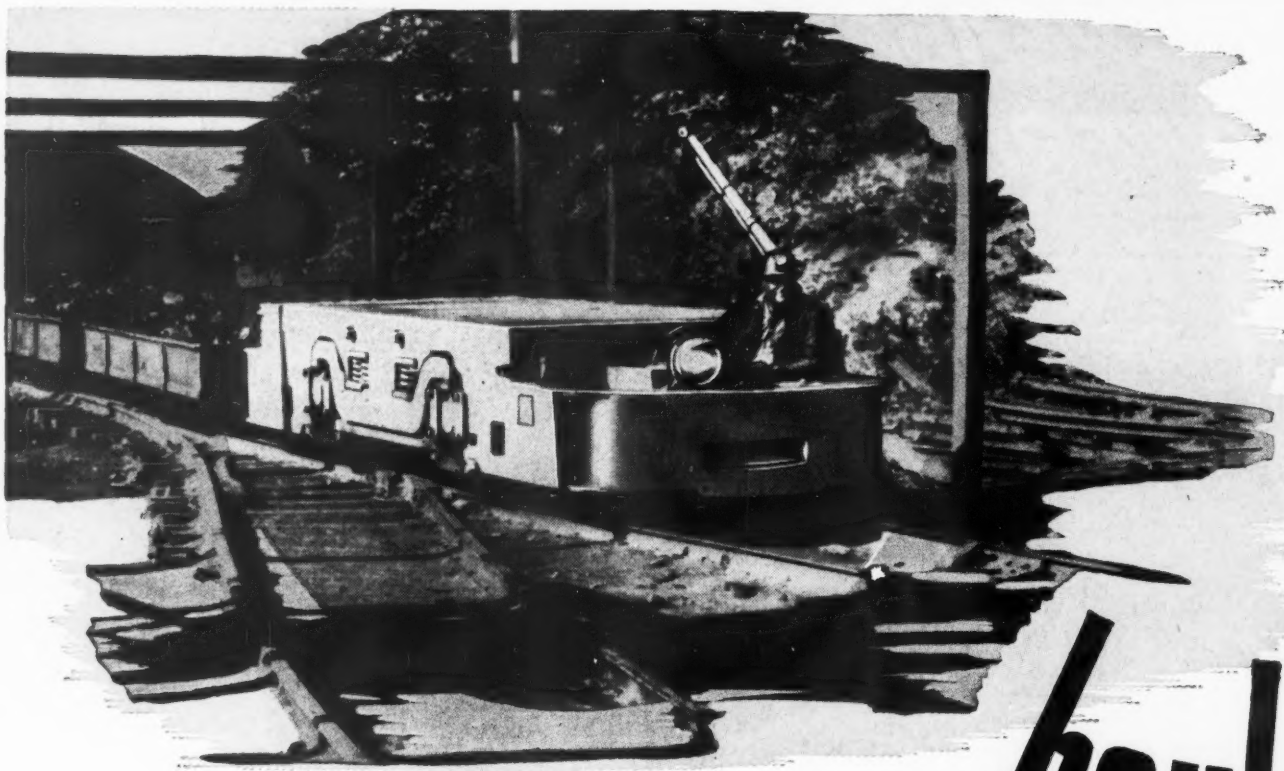
*Consult a Joy Engineer*



**JOY MANUFACTURING CO.**

GENERAL OFFICES: HENRY W. OLIVER BUILDING • PITTSBURGH 22, PA.





# hauls

...helps you meet

**HOW'S  
THIS  
FOR  
HAULING  
POWER**

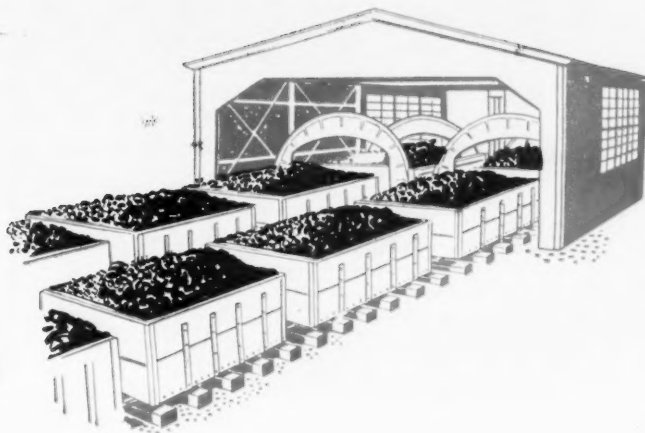
LOCOMOTIVE				WEIGHT OF TRAILING TRAIN IN TONS (2000 lbs.)						
Weight Tons (2000 lbs.)	No. of Motors	Rated Draw- bar Pull (Level Track)	M.P.H. at Rated Drawbar Pull	Grades						
				Level	1%	2%	3%	4%	5%	6%
10	2	5000 lbs	9.0	167	96	66	49	38	31	25
10	2	5000 lbs	11.5							
13	2	6500 lbs	8.5	217	125	86	64	49	40	32
13	2	6500 lbs	10.5							
15	2	7500 lbs	8.0	250	144	99	73	57	46	37
15	2	7500 lbs	10.0							
20	2	10000 lbs	9.0	334	192	132	98	76	62	50
20	2	10000 lbs	10.5							
25	3	12500 lbs	9.5	418	240	165	122	95	77	61
25	3	12500 lbs	11.0							
30	3	15000 lbs	9.0	500	288	198	147	114	93	75
30	3	15000 lbs	10.5							

The weights of trailing train shown in this table are calculated using 30 pounds per ton for car and track friction and 20 pounds per ton for each per cent of grade. Locomotives may be obtained in either of the two speeds listed above.



# ...bigger loads faster...

## ...tighter schedules



### Trolley-Type Mine-Haulage Locomotives

If high production demands have put the pressure on your hauling operations, there's only one way to beat the problem. Haul more coal per trip and haul it faster! That's a job for G-E trolley-type mine-haulage locomotives. Because they're conservatively rated and equipped with force-ventilated traction motors, they withstand the heaviest-duty work cycles. Power is applied smoothly. This enables you to operate these units close to the wheels' slipping point even with heavy loads.

#### GOOD "TRACKING" MEANS FASTER TRIPS

G-E locomotives are built to hold the rails at high speeds. They're suspended on coil springs that minimize "bobbing" and track pounding. Thus, the operator can maintain higher running speeds at crossovers, turnouts, curves and on the straightaway. These locomotives are easier to operate, too. Control manipulation requires little physical effort or manual dexterity. And—they run

for long periods between overhauls. We've prepared an illustrated bulletin describing these locomotives. Write today for Bulletin GEA-4676. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

#### STRONG ON PERFORMANCE—EASY ON SERVICE!

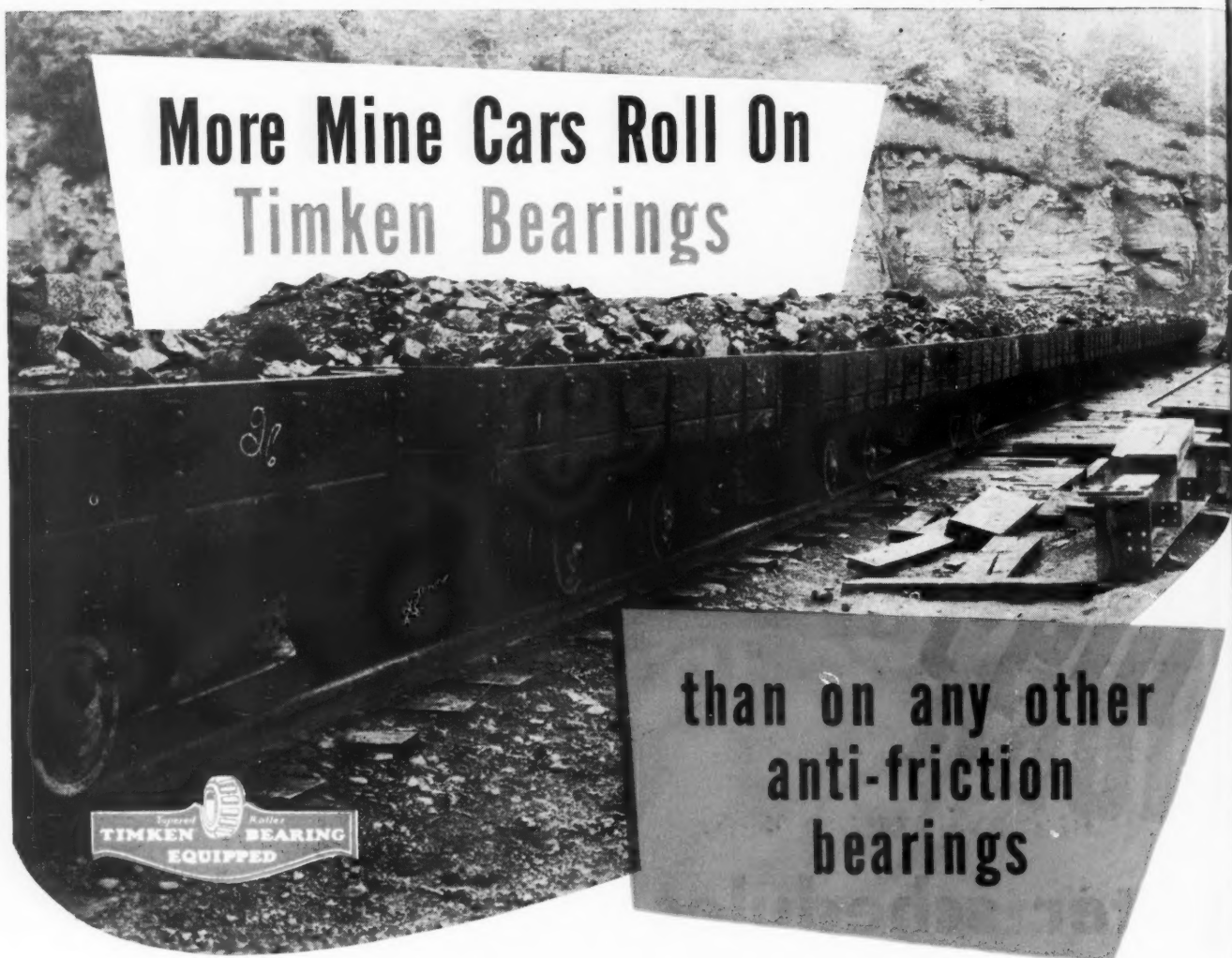
**Smooth-riding Chassis** Frame is all-welded and insulated from road jolts and jars by coil springs. Hard-wearing wheels ride on roller bearings. Dirt is sealed out of journal boxes.

**Hard-working Motors** Frames are one-piece steel castings. Windings are made with rectangular conductors to minimize power losses and heating. Heat-treated gearing resists wear for long periods.

**Long-lived Controls** Power-operated contactors open and close quickly. Arc is short—contactor tips last longer. All wire is neatly arranged, securely clamped and protected against physical damage.

**GENERAL  ELECTRIC**

# More Mine Cars Roll On Timken Bearings



than on any other  
anti-friction  
bearings

Over half a million mine cars have gone into service on Timken Bearings. A large number of these bearings are still going strong after many years of operation, having long outlasted the original car bodies — in some instances several car bodies.

More and more new mine cars are going on Timken Bearings all the time. Mine operators prefer them because they increase tonnage per car trip; reduce hauling cost per ton; simplify lubrication; cut maintenance costs; increase wheel and axle life.

One of the latest Timken Bearing mine car installations is at the new Nicholas County, W. Va. mine of Raven Coals, Inc., operating in the Peerless seam. It consists of 50 new, large drop bottom cars built by American Car & Foundry Company. Some of these cars are shown in the photographs. Make sure you have Timken Tapered Roller Bearings in the new cars you buy. Look for the trade-mark "TIMKEN" on every bearing that goes in the cars you build. The Timken Roller Bearing Company, Canton 6, Ohio.

**TIMKEN**  
TRADE-MARK REG. U. S. PAT. OFF.  
**TAPERED ROLLER BEARINGS**

NOT JUST A BALL  NOT JUST A ROLLER  THE TIMKEN TAPERED ROLLER  BEARING TAKES RADIAL  AND THRUST  LOADS OR ANY COMBINATION 



# Nevada

- **Variety of metals, minerals and ores of value to industry**
- **Power and irrigation projects**
- **Good living conditions**
- **Colorful scenic attractions**
- **Excellent rail transportation**



*\* One of a series of advertisements based on industrial opportunities in the states served by the Union Pacific Railroad.*

**M**anufacturers, packers and processors will find Nevada a storehouse of raw materials. There are deposits of copper, silver, gold, zinc, lead and uranium. Mineral ores and minerals include tungsten, manganese and antimony ore, magnesite, gypsum, sulphur, borax and vanadium. Building stone and marble also are available.

Cattle, sheep and poultry raising are expanding agricultural pursuits and there also is some

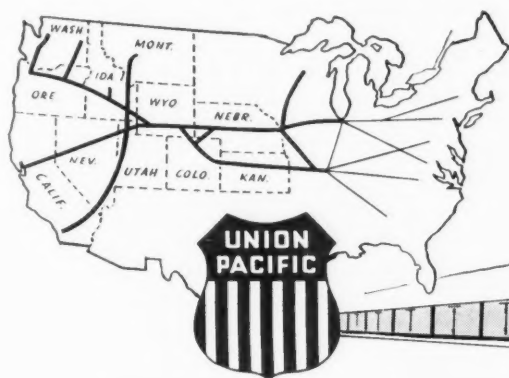
production of a variety of grains, vegetables and fruits.

Irrigation and power are supplied by several Federal projects including famous Hoover Dam.

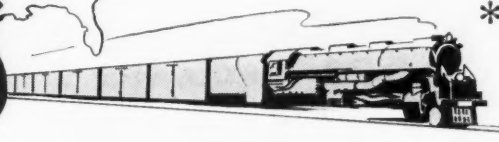
Nevada's healthful climate, excellent educational system, and a variety of scenic attractions contribute to the advantages of living in this western area.

Each year, thousands of vacationists visit gigantic Hoover Dam, beautiful Lake Mead and near-by picturesque Las Vegas.

Union Pacific provides top-notch freight and passenger transportation so essential to a State's industrial development.



*\* Address Industrial Department, Union Pacific Railroad, Omaha 2, Nebr., for information regarding industrial sites.*



## UNION PACIFIC RAILROAD

THE STRATEGIC MIDDLE ROUTE



# Nature's Products *in The Raw*

## **Scientific Processing now upgrades the raw coal feed into Metallurgical and Steam Coals**

Nature's products usually are not good enough for modern use. Man has to lend a hand. Even gold must be separated from the dross.

There was a time when coal came from nature's basins, rich in heat energy, suitable even in its raw state, for metallurgical fuel.

**Virgin Metallurgical Deposits Vanishing**  
Today, much of the natural high-grade raw coal has been mined. We find, in its stead, a "half-and-half" product, mixed by nature with noncombustible material.

As nature's supplies of metallurgical coal have dwindled, the coal preparation plant has become a vital necessity because it can take the raw coal feed, remove the impurities, and upgrade the product into metallurgical and high-grade steam coals.

### **Man-Made Metallurgical Fuel**

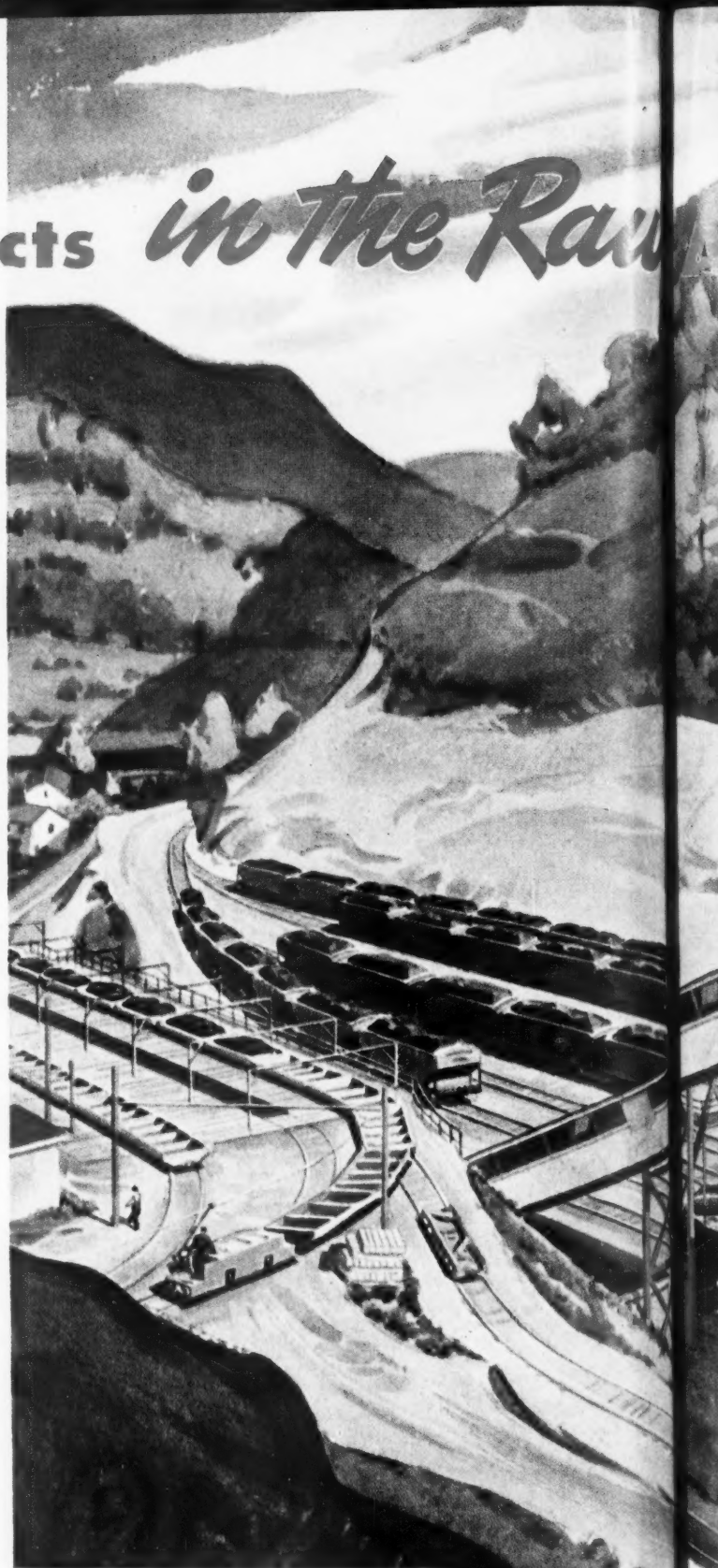
The preparation plant shown here is producing those upgraded premium-priced fuels every day from coal which is far from the virgin metallurgical standard. The coal is washed, impurities removed . . . automatically . . . at a cost of only a few cents per ton.

### **Greater Value for User and Producer**

Operators get premium prices for specification fuel, and industry is sure of its supply in steady abundance . . . a much better fuel value for the money.

The technical staff responsible for designing these preparation plants will be glad to consult with you.

*(Color reproduction of the Truax-Traer Coal Preparation Plant, at Shamrock Mine, Number 1, Kayford, W. Va.)*

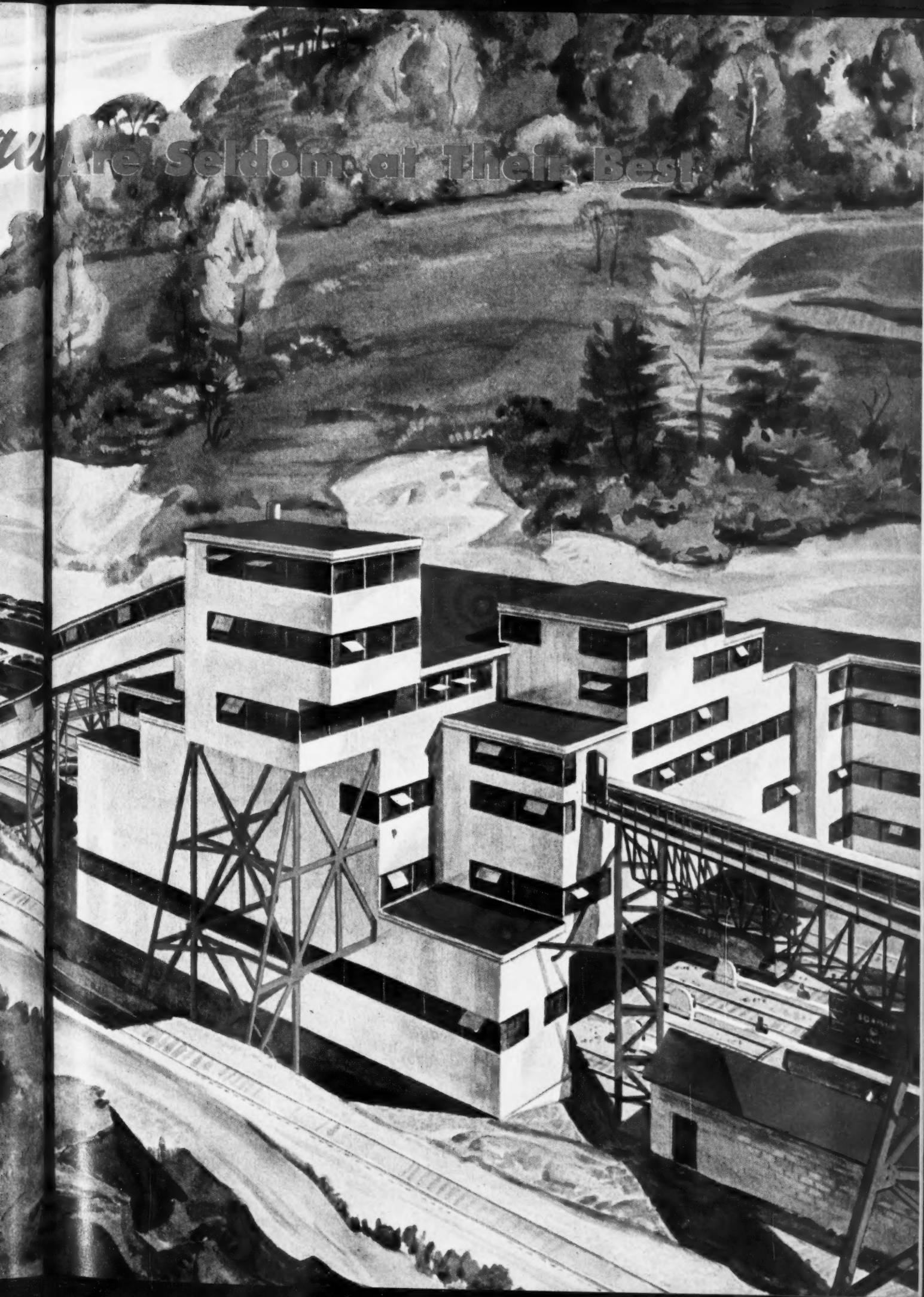


# **McNALLY PITTSBURG**

MANUFACTURERS OF EQUIPMENT TO MAKE COAL A BETTER FUEL

McNally Pittsburgh Manufacturing Corporation—  
Plants: Pittsburgh, Kansas  
Wellston, Ohio  
Engineering & Sales Offices: Pittsburgh, Kan. • Chicago (1), Ill.  
Pittsburgh (22), Penna. • Wellston, Ohio  
Caixa Postal 1310, Rio de Janeiro, Brazil

**Are Seldom at Their Best**





*a thousand  
and one...*

# MACWHYTE WIRE ROPES

**...all job-proved...assure you the**

**correct rope for your equipment**

When you use the correct wire rope, both the rope and your equipment last longer, cost less to operate. Macwhyte consulting engineers will check your equipment and recommend the wire rope specifically engineered for your job. Ask your Macwhyte distributor, or write Macwhyte Company.

MACWHYTE PREFORMED AND NON-PREFORMED INTERNALLY LUBRICATED WIRE ROPES... MONARCH WHYTE STRAND Wire Rope...Special Traction Elevator Rope...Stainless Steel Wire Rope...Monel Metal Wire Rope...Galvanized Wire Rope...Spring-lay Wire Rope...Atlas Braided Wire Rope Slings, Hi-Fatigue Aircraft Cables, Assemblies and Tie-Rods. Catalogs on request.

**Make MACWHYTE your headquarters  
for WIRE ROPE and SLINGS**

## **MACWHYTE WIRE ROPE**

**Manufactured by Macwhyte Company  
2931 Fourteenth Avenue, Kenosha, Wisconsin**

**Mill Depots: New York • Pittsburgh • Chicago • Minneapolis • Fort Worth  
Portland • Seattle • San Francisco • Los Angeles  
Distributors throughout the U.S.A. and other countries**

NO. 927



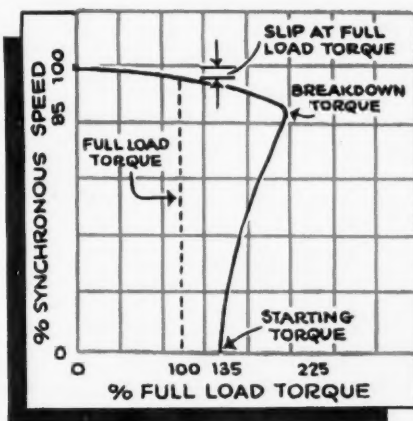
Sure,  
for y  
motor  
consu  
place  
to fol  
ing at

Study  
For  
nomi  
for  
prov  
Whe  
corre  
your  
He'l  
omm  
buil

COA



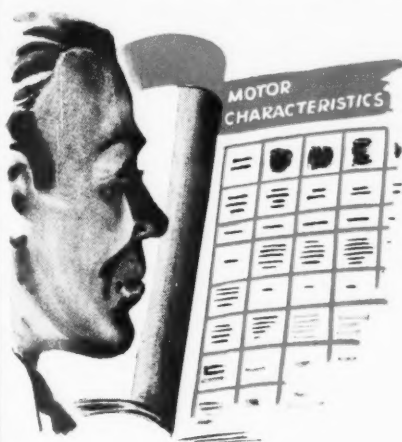
# Here's One Way to Choose Motors...



Sure, Your Local "Swami" can pick a motor for you in an instant! But if you want motor counsel you can *bank* on . . . you'll consult a reputable motor manufacturer. In place of crystal-ball gazing, he'll advise you to follow *practical* and *orderly* steps in arriving at *right* motor selection. For example . . .

First, Study Your Power Supply . . . voltage, frequency, number of phases; the p.f. required by your utility. Judicious selection will help balance your motor capacity . . . lower power costs. And check the voltage regulation—choose motors with enough torque to start and carry the load. Next . . .

Study the Driven Machine and surroundings. What hp? What starting torque? Will you need a horizontal or vertical motor—direct-connected, belt-driven or gear-operated? How about surroundings—ambient temperature, moisture, corrosion, dust. Each calls for a particular type of protection. Now . . .



**Study Your Motor Characteristics.** *A-c* motors? For most jobs they're satisfactory and economical. *D-c* motors? For wide speed range; for fast acceleration or reversal they may prove your best bet. *Synchronous* motors? When applicable they give you low-cost p.f. correction. You're *still* undecided? Call in your nearby Allis-Chalmers motor expert. He'll be glad to help you decide—with recommendations backed by 50 years of motor-building!

## Wise Motor Choice Saves Power; Ups Profit!

**Y**ES, CRYSTAL-BALL GAZING methods are out when you're trying to get *maximum* return on your electric motor investment. Slip-shod selection usually results in over-capacity, high power and maintenance bills—the kind of costs that in the competitive era of tomorrow you won't be able to afford!

That's why it pays to know more about *all* types of motors . . . their operation . . . limitations . . . maintenance. And there, too, is where your Allis-Chalmers motor expert can be of real help! ALLIS-CHALMERS, MILWAUKEE.

A 2328



# ALLIS-CHALMERS

One of the Big 3 in Electric Power Equipment—  
Biggest of All in Range of Industrial Products



## **NOTE WHAT**

## **NEW KB INTERNATIONALS OFFER**

- 1. A Truck of the Right Size and Type for Every Job.**
- 2. Performance-Co-Ordination.**
- 3. Load-Co-Ordination.**

Yes, International Trucks are profit-makers for coal companies for the three compelling reasons listed above.

*They're Performance-Co-Ordinated.* That means they're expertly fitted to their jobs. And that in turn means rock-bottom operating economy and long, trouble-free service.

*They're Load-Co-Ordinated.* And that means an expert recommendation from your International Dealer or Branch about the exact amount of payload *most* profitable for *your* trucks on *your* jobs.

Tune in James Melton on "Harvest of Stars!" NBC Sundays!

International Load-Co-Ordination is based on the International Truck Point Rating System—exclusive with International—and a scientific system—(Note that!)—not guess work.

So no matter what your truck problem, see your International Dealer or Branch—for the right trucks, expertly Performance-Co-Ordinated and Load-Co-Ordinated to *your* jobs.

Motor Truck Division

**INTERNATIONAL HARVESTER COMPANY**

180 North Michigan Avenue

Chicago 1, Illinois



# **INTERNATIONAL Trucks**

## AT CAVALIER, IT'S A "CATERPILLAR" SHOW



Pulling two side-dump Athey trailers, this "Caterpillar" Diesel D8 Tractor moves big yardage for Cavalier Coal Co.

THE Cavalier Coal Co. runs a big strip-mining operation near Snow Shoe, Pa. On the job are seven "Caterpillar" Diesel D8 Tractors, five D7s and a "Caterpillar" Diesel No. 12 Motor Grader.

Overburden averaging 40 feet in depth is being removed by two D8s and five D7s pulling Athey trailers, loaded by shovel, and four D8s hauling scrapers. The No. 12 Motor Grader builds and maintains haul-roads, cleans the face of the coal and windrows coal after blasting.

One "Caterpillar" Diesel D8, equipped with a "Caterpillar" No. 8A Bulldozer, is kept busy clearing land, roughing out roads and push-loading scrapers. Mr. D. S. Blount, a partner in the company, says: "We really like that bulldozer. It's fast in operation and easy to angle. We can change the blade position in less than three minutes."

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

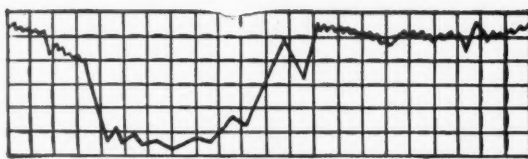


With its rugged "Caterpillar" No. 8A Bulldozer, a "Caterpillar" Diesel D8 Tractor clears the ground of trees, stumps and brush.

**CATERPILLAR**  
REG. U. S. PAT. OFF.  
**DIESEL**      ENGINES • TRACTORS  
MOTOR GRADERS  
EARTHMOVING EQUIPMENT

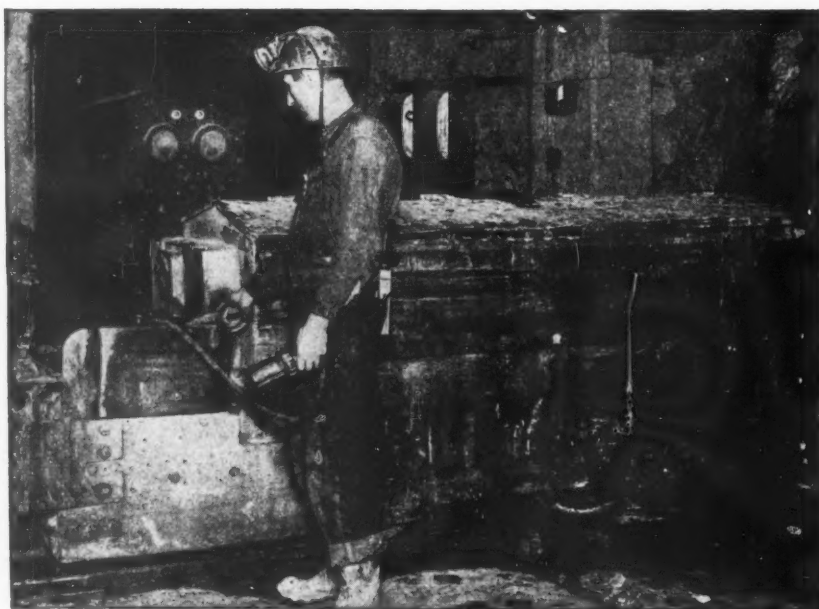


# Charge Them



# From Off-Peak Power

When you use EDISON Nickel-Iron-Alkaline Batteries as the power units of your battery-operated haulage equipment, you will find that an off-peak period of 6 to 7 hours per day is usually enough to get all the charging done with low-cost power. That is normally time enough for full recharge of a nickel-iron-alkaline battery.



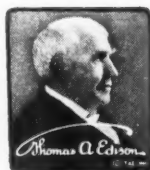
The charging can also be done direct from the d-c power lines through suitable resistors, because EDISON Nickel-Iron-Alkaline Batteries do not require critical adjustment of the charge rates.

### *Withstands Rough Usage—*

Yet this is only one of the operating advantages of EDISON Nickel-Iron-Alkaline Batteries. Their steel cell construction successfully withstands rough usage. Their electrolyte is an alkaline solution that is a natural preservative of steel. Their electro-chemical principle of operation is free from self-destructive reactions. As a result, they stay on the job and out of the repair shop; give longer service life than any other type of battery; cut annual operating cost. Edison Storage Battery Division of Thomas A. Edison, Incorporated, West Orange, N. J. In Canada: International Equipment Company, Limited, Montreal and Toronto.

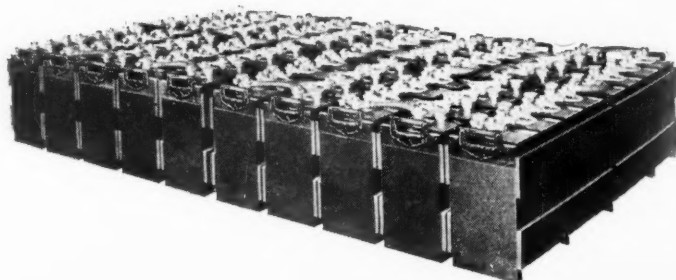
### *In Mine Locomotive and Shuttle Cars EDISON Nickel-Iron-Alkaline Batteries Give You These Important Advantages*

- ★ They are durable mechanically; grids, containers and other structural parts of the cells are of steel; the alkaline electrolyte is a preservative of steel.
- ★ They are foolproof electrically; are not injured by short-circuiting, reverse charging or similar accidents; are free from self-deteriorating reactions.
- ★ They can be charged rapidly; do not require critical adjustment of charge rates; can be charged directly from mine d-c supply.
- ★ They withstand temperature extremes; are free from freezing hazard; are easily ventilated for rapid cooling.
- ★ They can stand idle indefinitely without injury, without attention, and without expense.
- ★ They are simple and easy to maintain.



## EDISON

*Nickel • Iron • Alkaline*  
**STORAGE BATTERIES**



# Available-



• Magazines  
\* Plants

## AMERICAN EXPLOSIVES

From well-located plants and distributing magazines, AMERICAN explosives and blasting supplies are available for delivery throughout the eastern and middle-western sections of the United States. Produced under intensive research, chemical control, inspection and unremitting care in manufacture, there is an AMERICAN explosive suited to your requirement.

• Capable field engineers are available at your call.

- ★ HIGH EXPLOSIVES
- ★ PERMISSIBLES
- ★ BLASTING POWDER
- ★ BLASTING ACCESSORIES

### AMERICAN CYANAMID COMPANY

30 ROCKEFELLER PLAZA • NEW YORK 20, N. Y.

#### EXPLOSIVES DEPARTMENT

SALES OFFICES: Pittsburgh, Pa.

Bluefield, West Va.

Scranton, Pa.

Chicago, Ill.

Pottsville, Pa.

Maynard, Mass.



*Unit  
Responsibility*

KEY TO **MORE P**

More Westinghouse direct-current motors are used in coal mines than any other make. This Type SK dripproof motor drives a coal conveyor used for loading cars . . . typical of the many jobs they efficiently perform day in and day out.



**FROM FACE TO SURFACE . . . PRACTICAL HELP  
ON ANY ELECTRICAL OR POWER PROBLEM**

Today's demand means getting out every possible ton of coal . . . efficiently and economically. To accomplish this, every piece of equipment must operate at, or close to, the built-in capacity . . . thus insuring the maximum tonnage of coal per unit and per man delivered to the refining plant.

Electrification of mine equipment—the quickest means of getting “more coal per hour”—has been a responsibility of Westinghouse engineers for many years. Their background of knowledge and experience is the basis for equipment

designed to give 100% performance *every day* . . . even under the most grueling operating conditions.

From face to surface, Westinghouse provides a single co-ordinated source for electrical equipment to operate every type of apparatus used in mining. It is this unit responsibility that assures the most efficient application of power for every job. Consult your nearest Westinghouse office or write Westinghouse Electric Corp., P. O. Box 868, Pittsburgh 30, Pa.

J-94742

Putti  
prob  
prob  
selec  
mean  
divic  
ance  
W  
From

IGNI  
port  
depe  
Pict  
Subs  
Tran  
and

LO  
me  
for  
un  
sh  
hi



# PRODUCTIVE POWER

**"WESTINGHOUSE-EQUIPPED THROUGHOUT" MEANS SIMPLIFIED ORDERING, QUICKER INSTALLATION, MORE EFFICIENT OPERATION**

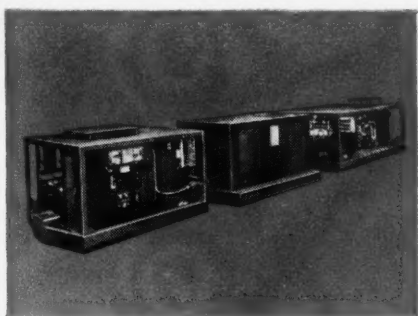
Putting power to work *productively* can be a major problem . . . or a simple one. When items must be selected, ordered and received from many sources, it means many chances for costly errors and delays . . . divided responsibility—or none at all—for performance of installed equipment.

Westinghouse offers the way to simplify the job. From equipment for generation of electrical or steam

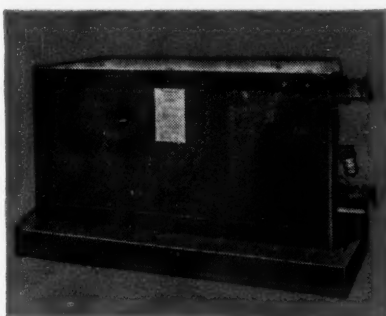
power, to the most specialized types of drives, gearing and control for its utilization, Westinghouse provides a single source of supply . . . one broad pair of shoulders competent to take responsibility for performance of all parts of the job.

Here are a few of the places where Westinghouse unit responsibility prevents headaches . . . saves money . . . assures more productive power.

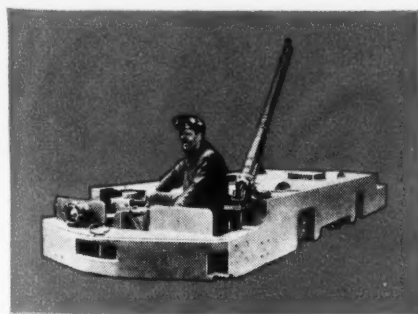
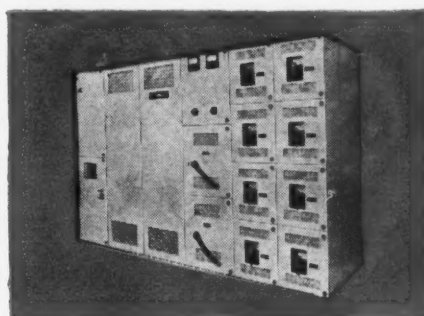
**IGNITRON RECTIFIER**—Lightweight, portable Ignitron equipment for efficient, dependable power conversion in mines. Pictured is a typical 3-truck Ignitron Substation complete with Dry-Type ASL Transformer, sealed Ignitron Rectifier, and automatic a-c and d-c switchgear.



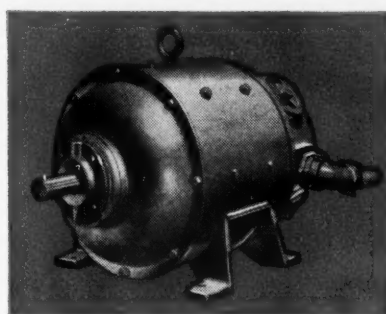
**TRANSFORMERS**—The complete Westinghouse line of power and distribution transformers includes oil or inerteen-immersed and air-cooled units—for mining service above and below ground. Shown is a 200-kva, ASL Mine-Type Transformer.



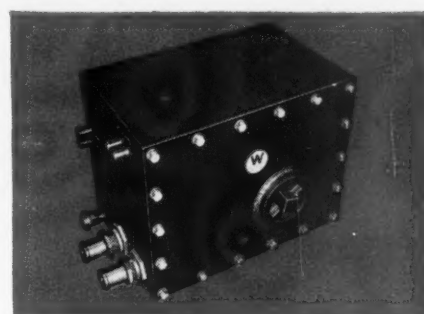
**SWITCHGEAR**—Westinghouse supplies a wide range of "Unitized" metal-enclosed switchgear that permits quick, economical installation. Photo shows a type ASL Power Center with high-voltage section at left and low-voltage at right.



**LOCOMOTIVES**—Westinghouse builds most types of mine locomotives required for transportation of coal and supplies, underground and on the surface. Photo shows the *Low Liner*—only 26 inches high—for low seam operation.



**MOTORS**—Westinghouse motors represent the most advanced design and operating efficiency, with utmost resistance to moisture, corrosion and abrasion. Photo shows a d-c "explosion-proof" SK motor.



**CONTROLS**—Westinghouse controls cover the entire range of a-c and d-c applications to meet all mine operating conditions. Photo shows an explosion-proof enclosure for a-c or d-c starters.



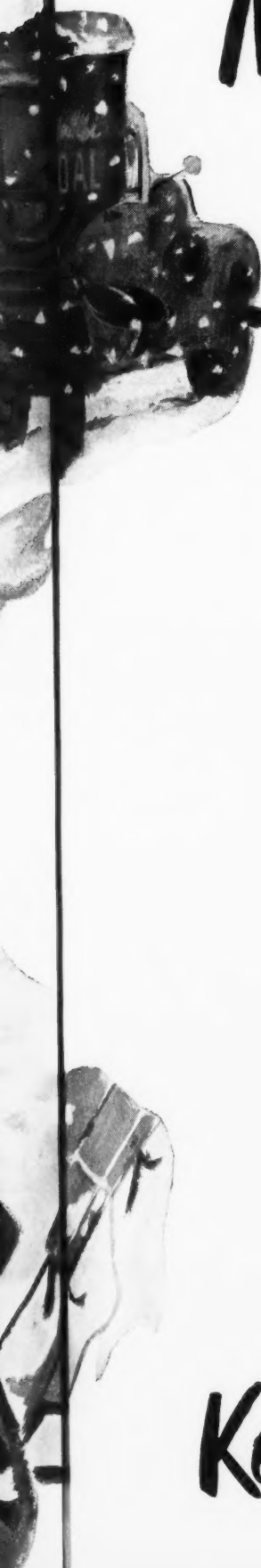
# Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE



**MORE PRODUCTIVE POWER FOR INDUSTRY**



A vertical illustration on the left side of the page depicts a coal train. At the top, a locomotive is visible, followed by several open-top coal cars. The train is shown in profile, moving downwards. The illustration is rendered in a dark, textured style, possibly using ink or charcoal, with some white highlights on the train's components.

# Mom! Mom—it's come!

**D**EMAND for coal is tremendous. Coal producers realize keenly that the present situation is hard on every coal retailer. Coal consumers of every class clamor for the coal they want, the way they want it, when they want it.

This condition is being met with action. Coal operators in the territory served by the Chesapeake & Ohio Railway are spending millions of dollars for improved equipment, and for more coal-producing properties.

Matching this movement, the Chesapeake & Ohio is now expanding its coal-carrying facilities at an unprecedented rate. New C&O lines are being built over and through mountains to reach and serve the new producing properties. And note this: these new producers will not be put into temporary operation to tide over an emergency. They will be permanent. Every effort is being made to reestablish and maintain balance between coal supply and demand.

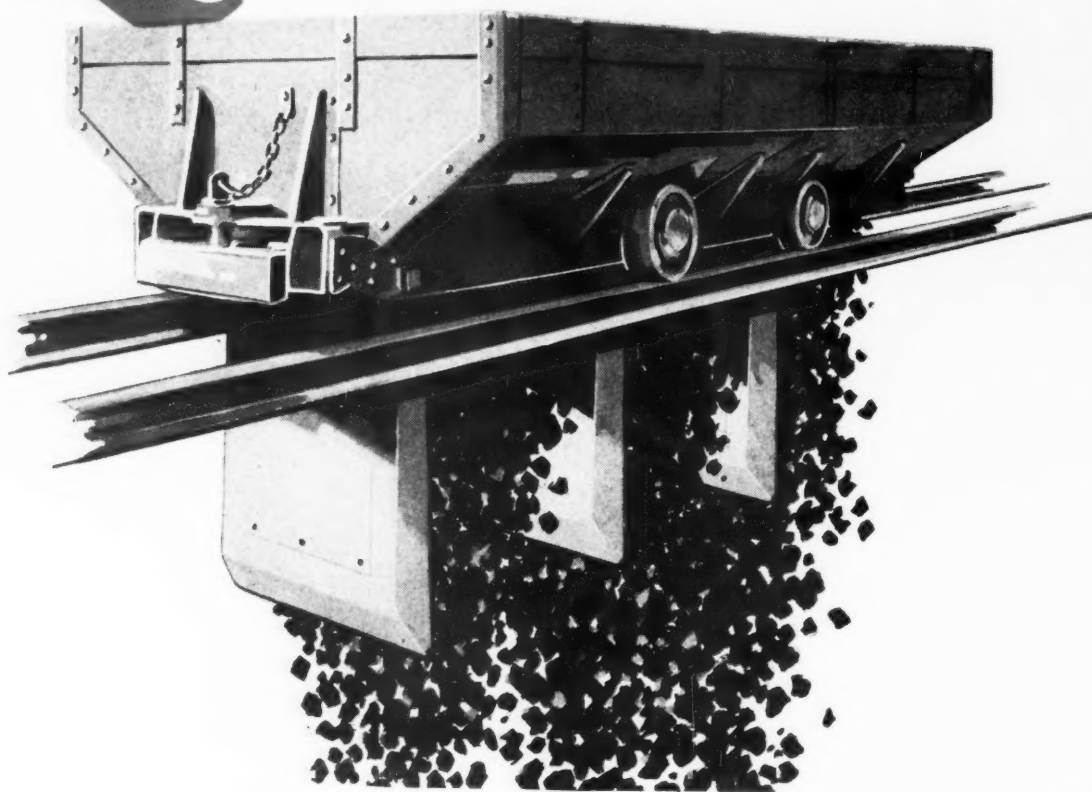
The Chesapeake & Ohio Railway shares with the coal industry the resolve that coal shall not only continue to be the nation's greatest resource and most dependable fuel—but that its supply shall be equally dependable and adequate.

Chesapeake & Ohio Railway

*Keep the home fires burning coal*



# Q*uick* D*umping*



*ups coal output!*

## Q.C.F. MINE

A.C.F.  
DROP BOTTOM  
MINE CARS

*Automatically*

SAVE COSTLY MINUTES

A.C.F. "Lubricated" doors trip-and-unload, close-and-latch while the car is in motion. Faster and more surely, the smooth operating mechanism makes it possible to dump a 16-car trip of 5-ton Drop Bottom Cars in just 80 seconds! Such speed in dumping saves time and money...keeps loading machine efficiency higher...increases the coal output of your mine.

Take time out now to ask our Sales Representative to explain the many advantages of A.C.F. Drop Bottom Mine Cars. It'll be time well spent.

E CARS

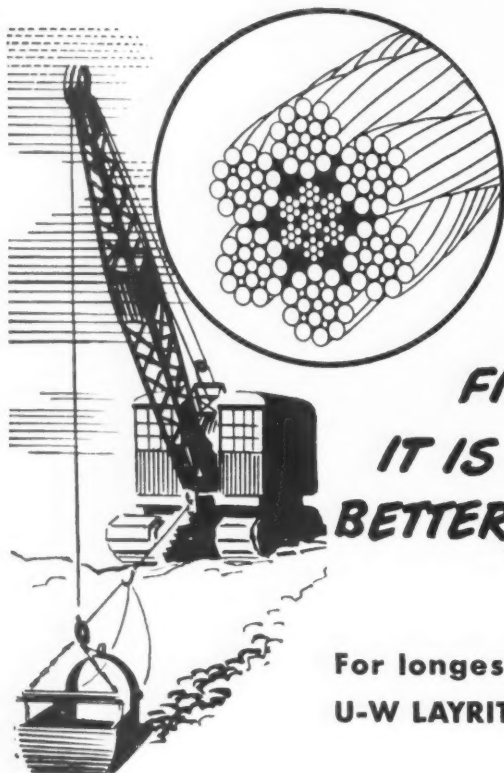
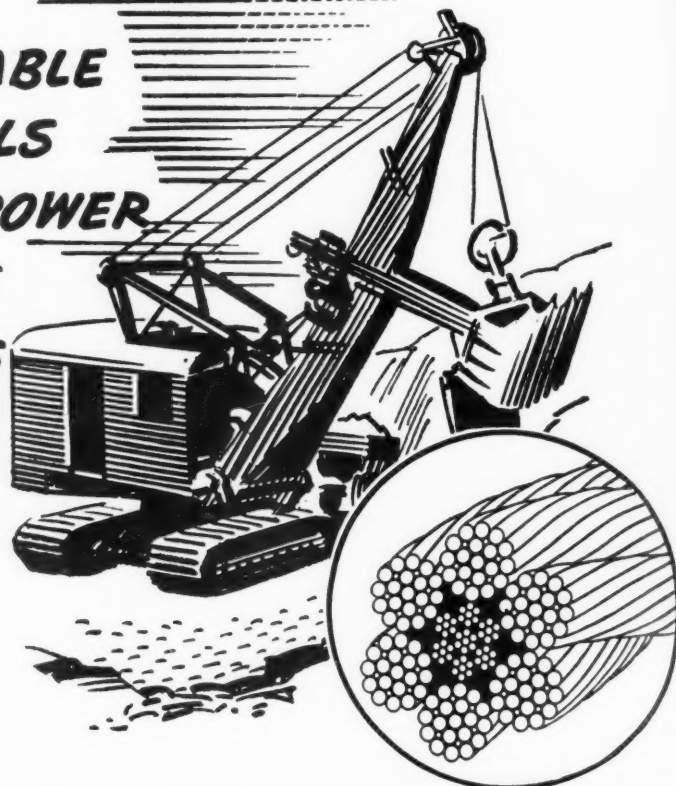
American  
C ar and  
f oundry Co.

NEW YORK  
CHICAGO  
CLEVELAND  
WASHINGTON  
HUNTINGTON, W. VA.  
ST. LOUIS  
BERWICK, PA.  
PITTSBURGH  
PHILADELPHIA  
SAN FRANCISCO

# ***SOME ROPES FOOL YOU***

***U-W 6×19 FILLER WIRE CABLE  
IS IDEAL FOR BOOM FALLS  
AND HOIST ROPES ON POWER  
SHOVELS BECAUSE IT IS  
FLEXIBLE AND RESISTS  
FATIGUE AND ABRASION***

***BUT...***



***FOR DRAG CABLES ON DRAG  
LINE EXCAVATORS, U-W 6×16  
FILLER WIRE IS BETTER BECAUSE  
IT IS COARSE AND RESISTS ABRASION  
BETTER, YET IS SUFFICIENTLY FLEXIBLE***

**For longest and best service, always specify  
U-W LAYRITE (Preformed) IMPROVED PLOW STEEL**

*We invite you to let UPSON-WALTON engineer your tough rope jobs.*

Copyright 1947—The Upson-Walton Company

## **THE UPSON-WALTON COMPANY**

**Manufacturers of Wire Rope, Wire Rope Fittings, Tackle Blocks, Brattice Cloth**

*Main Offices and Factory: Cleveland 13, Ohio*

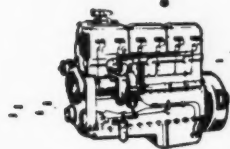
114 Broad Street  
New York 4

737 W. Van Buren Street  
Chicago 7

241 Oliver Building  
Pittsburgh 22

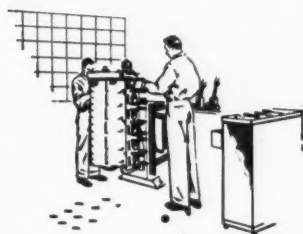




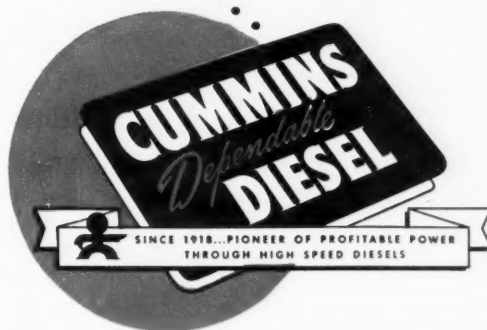


A Quality Engine

Genuine Cummins Parts



Nation-Wide Service



## Protected Investment

Your investment in Cummins Dependable Diesels pays dividends because of their extra capacity for work . . . their low maintenance and fuel costs . . . their reliable performance with a minimum of downtime. Protection for your investment is assured by your Cummins dealer who makes available to you genuine parts, trained diesel mechanics and technical assistance no matter where or from whom your Cummins Dependable Diesel is purchased.

CUMMINS ENGINE COMPANY, INC. • COLUMBUS, INDIANA

# Speed up your dozer work



**4 Speeds forward  
4 Speeds REVERSE  
... up to 15 m.p.h.**

**T**oday's 180 h.p. Model C Tornado dozer brings you the speed and economies of rubber-tired power you've always wanted on your dozer work.

For example . . . consider how much more production you'll get with Tornado speeds up to 15 m.p.h. . . . both forward AND REVERSE! That's approximately double the fastest crawler speed.

## **Increased efficiency**

In addition, the Tornado's new constant-mesh transmission gives you instant selection of gear ratios anytime . . . without loss of momentum, or stopping to shift gears. Just move selector lever to speed you want and air-actuated clutches give it to you RIGHT NOW.

You'll also find its low center of gravity and wide tread give you greater stability . . . its short-coupled wheelbase increases maneuverability. And remember, you get the same fast, easy blade action you have come to expect from LeTourneau cable dozers.



**See your LeTourneau Distributor  
NOW for complete information**

# Work with a **TOURNADOZER**



## Ample flotation and traction

Four big 21.00 x 25 low-pressure tires assure ample flotation and traction for the toughest kind of going . . . there are no track rollers to lubricate. . . . no expensive moving parts to grind and wear in abrasive materials. You roll on air instead of steel.

## See what it can do for you

Why buy slow-moving, high-maintenance dozer equipment . . . when you can get a modern, high-speed Tornado dozer? Check with your LeTourneau Distributor today for complete information on performance, prices and delivery . . . **ORDER NOW!**



## Twice as fast as crawlers

Tornado dozer gives you four speeds up to 15 m.p.h. . . . both forward and reverse . . . plus instantaneous non-stop speed selection, which enables you to get into higher gears faster . . . climb steep grades and soft fills easier . . . lower dead-head reverse time.



## Works or travels anywhere

Tornado dozer can go anywhere on property in a hurry . . . rolls at 15 m.p.h. from pit to dump, from bank to hopper, from mine to mine. No waiting for trailer. When your dozer is in one spot and you need it in another . . . just hop on and go.



## Operator's dream come true

Operator rides easy on big low-pressure tires . . . sits easy on hydraulic suspension seat . . . takes it easy because handy air-actuated controls take the labor out of operating. No neck-stretching . . . no clutches to fight . . . no end-of-day slow down.

Tornado dozer—Trademark R102—CM

**LETOURNEAU**  
PEORIA, ILLINOIS



**TOURNADOZERS**



# *Coming-* THE GREAT LAKES GREATEST! NEW TOLEDO COAL



*They're building now . . .* to be ready for the 1948 season. And they'll be the most modern, most convenient, and fastest coal and ore facilities on the Great Lakes.

*Two great railroads . . .* Baltimore & Ohio and New York Central . . . are working together to bring shippers this new coal and ore terminal, operated by The Lakefront Dock and Railroad Terminal Company.

*First port of call* as vessels approach Toledo . . . with 24-foot minimum depth at dockside . . . the terminal will be safe and easy for the maneuvering of even the largest vessels under any wind and tide conditions.

*High speed transfer* of coal from car to ship, without degradation, will be assured by three giant electric coal dumpers, and of ore from ship to car by two Hulett ore unloaders . . . with capacity of millions of tons a year.

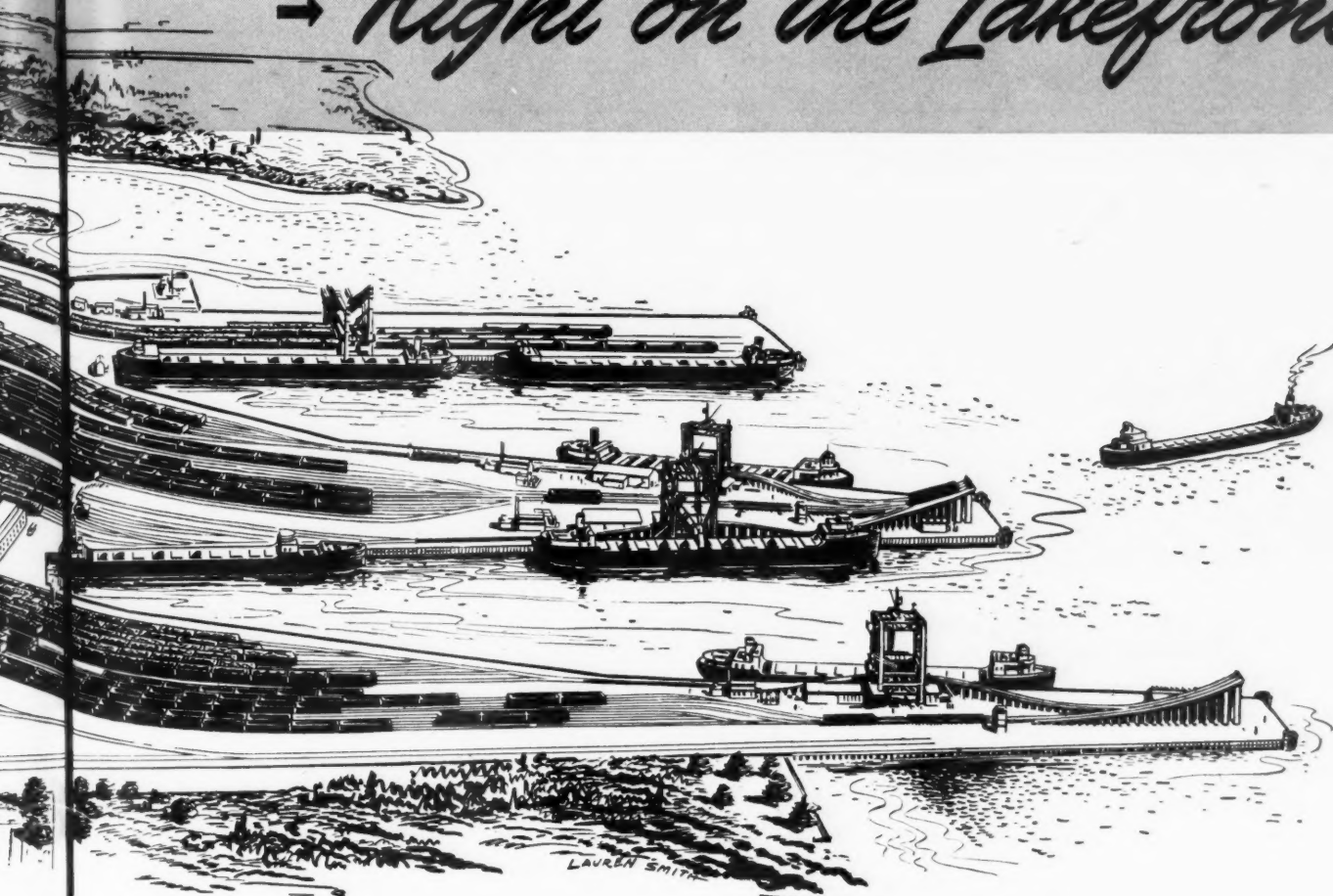


## THE LAKEFRONT DOCK AND R

NEW YORK CENTRAL

# LAND ORE DOCKS

→ *Right on the Lakefront!*



*Short-wave radio equipment* between ship and shore will add safety and speed in handling of cargoes and carloads.

*High capacity rail yards* for both loaded and empty cars will support the dock operations and provide direct connections to the big Toledo yards and main lines of both New York Central and Baltimore & Ohio railroads.

**STARTING IN 1948-**

Route your coal and ore shipment via this new convenient lakefront terminal... for fast, efficient handling.

## RAILROAD TERMINAL COMPANY

BALTIMORE & OHIO





## Split-Second Timing gets results . . .



### ATLAS ROCKMASTER BLASTING has a scoring punch

In modern basketball winning scores are the result of teamwork based upon split-second timing. In modern blasting, too, an amazing control of timing is producing outstanding results for blasters all over the country.

Now the blaster is able to time the delay elements of his shot in thousandths of a second . . . a feat never before possible . . . and fragmentation has increased tremendously. While still under the strain of the first blast, the rock is hit again . . . a split-second later . . . with terrific impact. The results are astounding.

In dollars and cents, Atlas Rockmaster means money saved. Reports coming in from one blasting operation after another continue to tell of frag-

mentation increased as much as 30% . . . shovel efficiency stepped-up . . . secondary shooting cut down . . . and complaints due to noise and vibration held to a minimum.

Of course, split-second timing is not the only factor in a Rockmaster blast. For Atlas Rockmaster is a complete blasting system . . . not just a timing device. All factors of the blasting problem — detonators, explosive and loading — are taken into account and ours to produce true Rockmaster effectiveness.

To find out how Rockmaster can be made to work for you with outstanding results . . . call in your Atlas representative.

ROCKMASTER GIVES  
YOU THE GREATER  
SAFETY OF MANASITE  
DETONATORS



Less Bark . . .  
More Bite

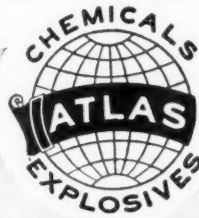


Manasite: Reg. U. S. Pat. Off. "ROCKMASTER" Trade Mark

# ATLAS

## EXPLOSIVES

"Everything for Blasting"



ATLAS POWDER COMPANY, Wilmington 99, Del. • Offices in principal cities • Cable Address—Atpowco



# Rome 60

## MINING MACHINE CABLE

**Look for "APPRO  
No. P-105"** ... molded in

the jacket. It's your assurance of  
Rome Cable's extra margin of safety.

Illustrated is Parallel Duplex Mining  
Machine Cable with Ground Wire.

## is **SAFE...** Because it **Resists!**

Rome 60 Mining Machine Cables meet Federal and State of Pennsylvania flame test requirements with a comfortable margin of safety. They will not sustain fire and spread of flame is well within the 14" permitted by law. In addition, safety from electrical shock is provided by adequate ground wire construction.

Further, there is economy of operation. The rugged Neoprene sheath gives all Rome 60 Mining Machine Cables characteristics of long life, such as resistance to corrosive elements, abrasion and mechanical shock. You can specify Rome 60 with confidence.

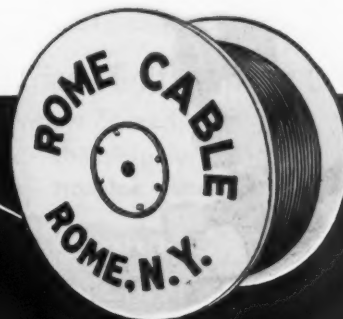
### THE ROME 60 LINE INCLUDES:

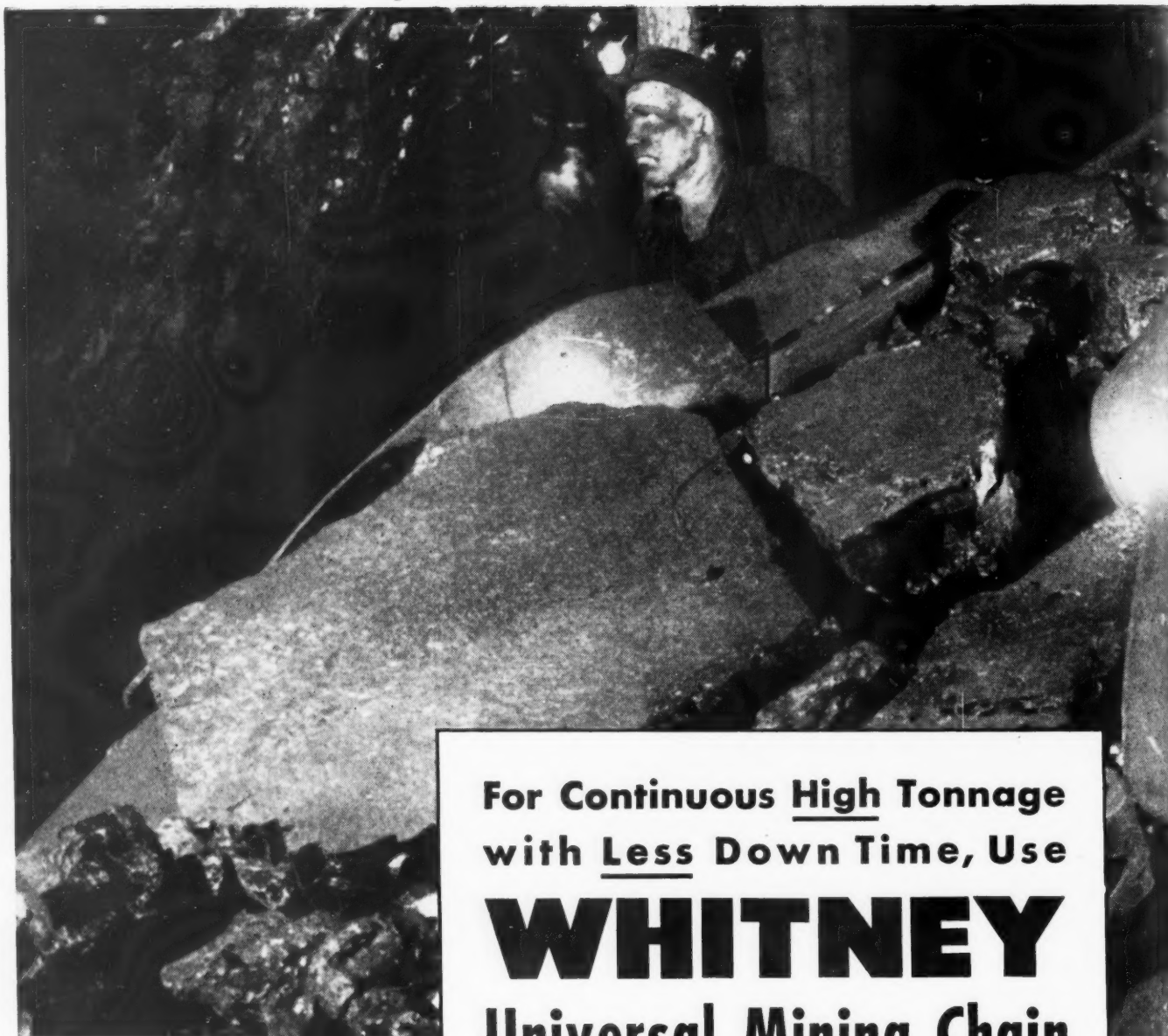
SINGLE CONDUCTOR LOCOMOTIVE GATHERING CABLE  
PORTABLE POWER CABLES  
TWO CONDUCTOR CONCENTRIC MINING MACHINE CABLE  
PARALLEL DUPLEX (TWIN) MINING MACHINE CABLE

- FIRE
- TEARING
- OVERLOAD
- HEAT
- FUMES
- OIL
- GREASE
- ABRASION
- MOISTURE
- ACIDS

FROM BAR TO FINISHED WIRE

**ROME CABLE**  
**CORPORATION**  
ROME • NEW YORK





For Continuous High Tonnage  
with Less Down Time, Use  
**WHITNEY**  
Universal Mining Chain



*Where the going is tough*, that's where Whitney Universal Mining Chain proves its superiority by out-performing, out-lasting ordinary chain.

For like all Whitney Chains, they're especially made to give long-lasting service in loaders no matter what the working conditions. All parts are made of alloy steel, heat-treated for extreme toughness and durability. The universal joints are made of alloy steel forgings, accurately machined. Flight studs are fully machined and have milled threads. End pins are fully riveted into deep counter-sink in the forging to provide maximum anchorage.

Keep your equipment up-at-the-face producing . . . equip your loaders with Whitney Universal Mining Chains. They will give top performance and save you money with their long operating life. See the Whitney Distributor serving your territory or write:

**The WHITNEY Chain & Mfg. Co.**

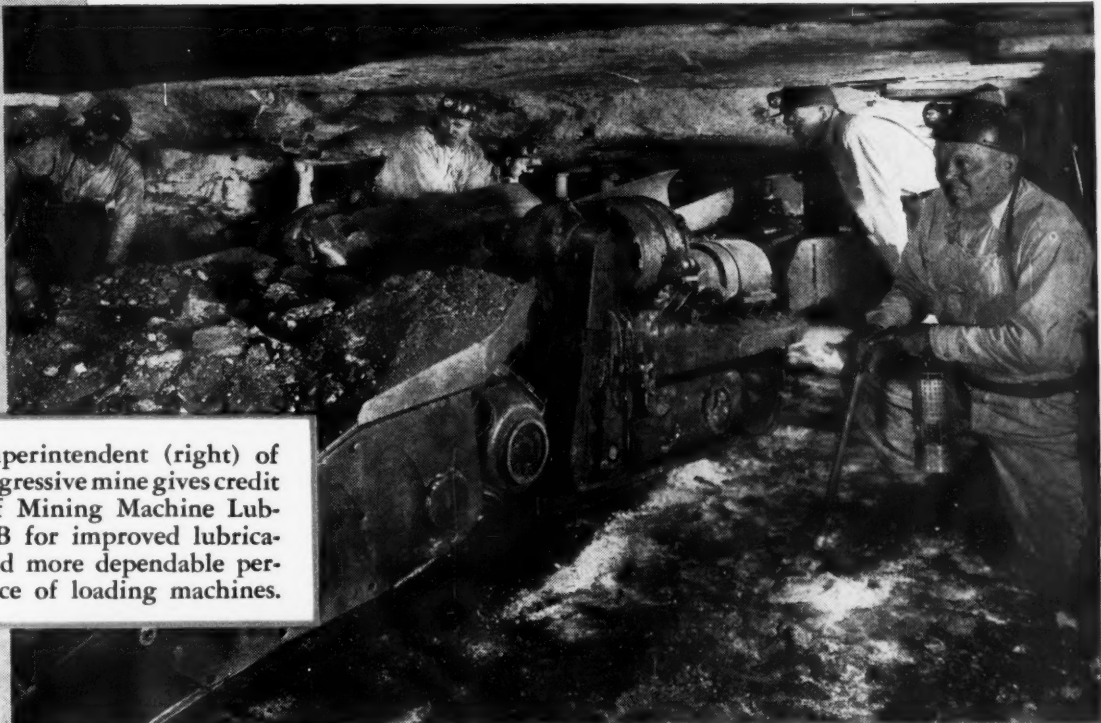
Your Assurance of Proven Power Transmission and Conveying Since 1896

HARTFORD 2, CONNECTICUT

—▶

**"Now -- thanks to**  
**Gulf Mining Machine Lubricant B**  
**ALL** **of our loaders stay on the job"**

says this Superintendent



The Superintendent (right) of this progressive mine gives credit to Gulf Mining Machine Lubricant B for improved lubrication and more dependable performance of loading machines.

**"W**HEN one out of five loaders is down for repairs all the time, you're in trouble," says this Superintendent. "And when a change in lubricants solves the problem, you can readily see how lubrication affects production."

"That's the story of our loading machines before and after we switched to Gulf Mining Machine Lubricant B. This quality product, plus a change in the method of application as recommended by a Gulf Lubrication Engineer, put a stop to bearing and gear failures in our loader gathering heads. As a result, all five loaders now stay on the job."

It will pay you to investigate Gulf Mining Machine Lubricant B for your loading and cutting machines—to end present troubles and to prevent future ones.

For long, trouble-free mining machine life, call in a Gulf Lubrication Engineer today and ask him to demonstrate the superior qualities of Gulf Mining Machine Lubricant B! He will show you why it prevents lubricant channeling and throw-off, lubricant leakage, entrance of abrasive coal dust, and resists the action of water. Write, wire, or phone your nearest Gulf office.

**Gulf Oil Corporation • Gulf Refining Company**

Division Sales Offices:

Boston • New York • Philadelphia • Pittsburgh • Atlanta  
 New Orleans • Houston • Louisville • Toledo





# For Safer Haulageways



## DIRECT HITCHING AND STEEL MINE TIMBERS

**M**ORE and more mines are increasing mine safety by hitching steel timbers directly into ribs, or setting supports on steel sections hitched in.

Not only is this "legless" timbering proving safer than wall or pier timbering methods, but it is providing savings in reduced installation costs. And it eliminates frequent retimberings because of decay of legs.

There are sound reasons for steel's superiority in timbering. New steel structural sections are balanced sections with definite uniform sectional prop-

erties. They can be purchased to guaranteed minimum physical properties with uniformity throughout. They are fabricated with greater ease and with less possibility of setting up future sources of danger. They are more economical and because they weigh less than secondhand rails of equivalent strength, new steel sections minimize labor and strain in handling.

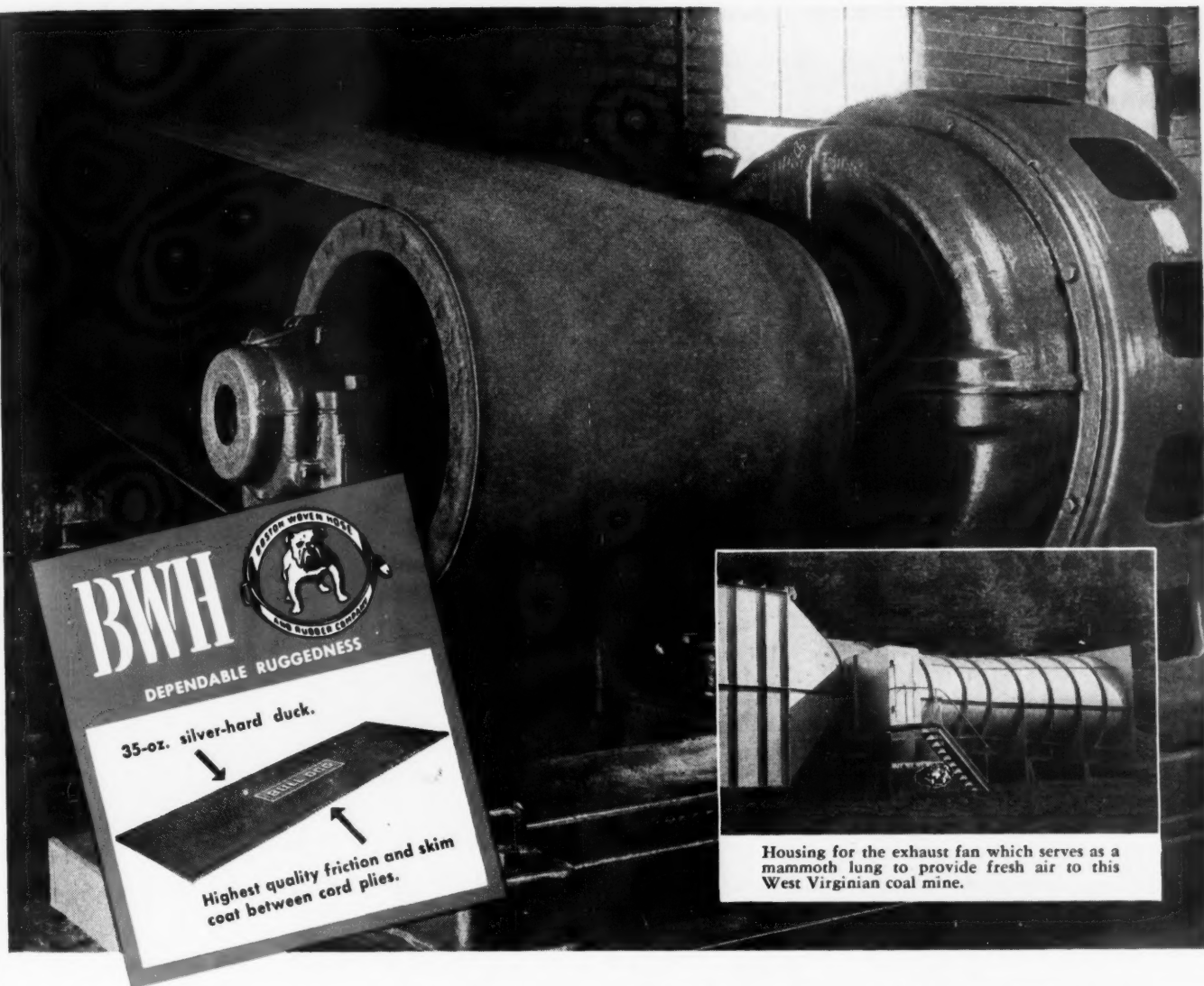
We will be glad to furnish all the information you need on safe, economical direct hitching with steel mine timbers—without obligation on your part.

### CARNEGIE-ILLINOIS STEEL CORPORATION *Pittsburgh and Chicago*

Columbia Steel Company, San Francisco, *Pacific Coast Distributors*  
Tennessee Coal, Iron & Railroad Company, Birmingham, *Southern Distributors*  
United States Steel Export Company, New York  
7-1096



# UNITED STATES STEEL



## THE "BLOWHARD" THAT SAFEGUARDS MINERS' LIVES

Another top performance by a **BWH** product

In the busy 1943 days of peak war production, a big West Virginia coal mine needed a transmission belt for its giant exhaust fan.

Because this fan supplies fresh air to workers far underground, high speed operation with no shutdowns was vitally important. Tragic disaster may stalk tunnels where heavy, gas-laden air accumulates, and workers get out of a mine as fast as possible if the ventilating system breaks down.

To handle this responsible job, BWH engineers specified a 36-inch, 9-ply Bull Dog Cord Belt with quality-controlled friction. The rugged

silver-hard duck cover adequately protects the low-stretch cord carcass of the belt. As a result, resiliency and recovery factors are assured under peak loads . . . trouble-free operation is maintained at maximum efficiency.

Working at a speed of more than a mile a minute, this rugged belt has chalked up an outstanding performance record . . . and it's still driving this huge safety fan, after four years of hard service.

Made by the exclusive ROTOCURE process of continuous vulcanization, BWH Belts have no "weak links" caused by press overlaps. And that

means they assure steady operation, long life and low maintenance costs on the toughest jobs.

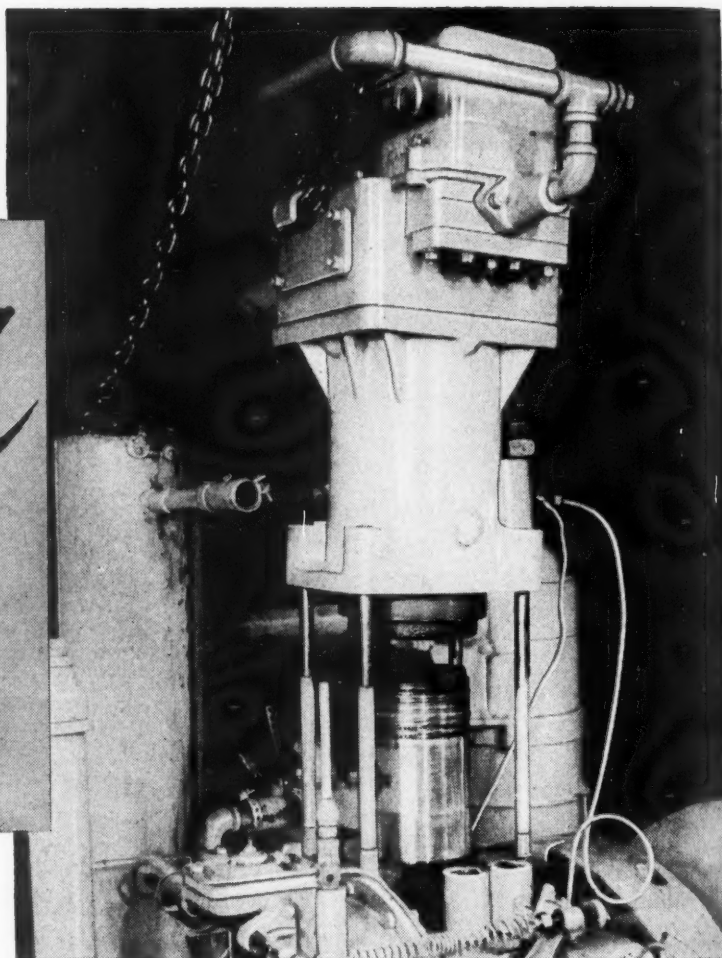
All BWH Industrial Rubber Goods are engineered for just one purpose . . . that is, to do a specific job extra well. Leading industries know they can always look to BWH for dependable ruggedness — to BWH distributors for dependable service.

### HAVE YOU A JOB WHERE STAMINA COUNTS?

Bring us your toughest problems — we're specialists in solving them. Consult your nearest BWH distributor, or write directly to BWH.

Another Quality Product of  
**BOSTON WOVEN HOSE & RUBBER COMPANY**  
 Distributors in all principal cities  
 PLANT: CAMBRIDGE, MASS., U.S.A. • P.O. BOX 1071, BOSTON 3, MASS.

# *Clean* ... FROM **EAST CHICAGO**



At Sinclair Research Laboratories, East Chicago, Ind., skilled technicians specialize in keeping it clean ... for you.

With today's accent on the detergency qualities of engine lubricants, Sinclair Research is constantly making tests to determine the cleansing properties of motor oils, diesel lubricants, and other products, using the special "come-apart" single cylinder diesel engine shown above.

Such tests—duplicating actual operating conditions—constitute an essential part of Sinclair's outstanding research, which has resulted in the development of ever finer petroleum products for over 30 years. At its soon-to-be-completed new Research Center, Harvey, Ill., Sinclair will continue to develop industrial and automotive lubricants of outstanding performance with greater facilities, finer equipment, and more highly skilled personnel than ever before.

## *Sinclair Lubricants for Above-Ground Equipment*

For Turbines:

**SINTURLITE OILS**

For Steam Cylinders:

**SINCLAIR STEAM CYLINDER  
AND VALVE OILS**

For Compressors:

**RUBILENE OILS**

For General Lubrication:

**COMMANDER OILS**

For Ball and Roller Bearings:

**BEARING GREASE AF**

SINCLAIR REFINING COMPANY • 630 FIFTH AVENUE, NEW YORK 20, N. Y.

# **SINCLAIR**

## *Lubricants for Industry*

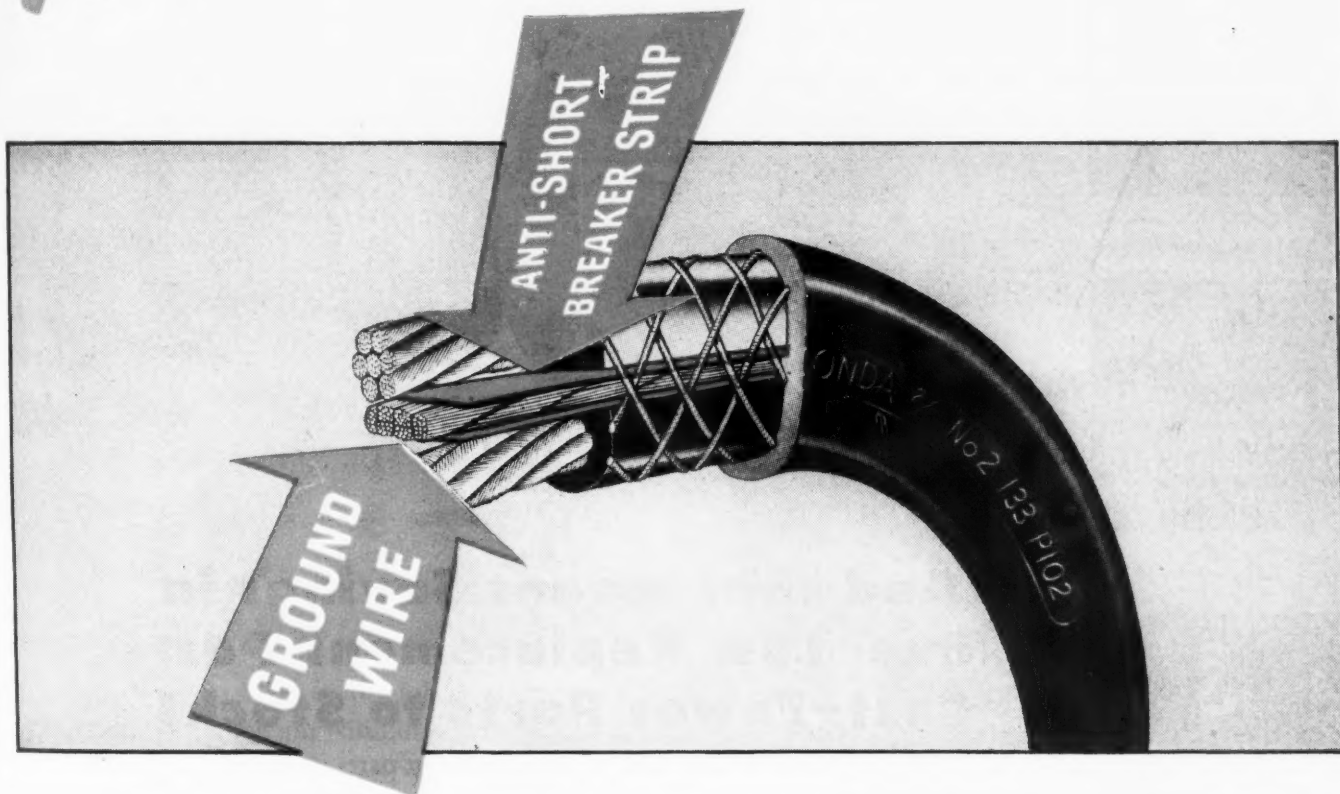
**FINEST CRUDES + EXPERT RESEARCH**

**and MANUFACTURING CONTROL = OUTSTANDING PERFORMANCE**



# NEW...

## **SMALLER DIAMETER PARALLEL MINING CABLE PACKS MORE ON A REEL**



**ANNOUNCEMENT:** Here it is! A new Securityflex parallel mining cable with ground wire that packs more cable on a reel, thanks to its new, smaller diameter. Other advantages of this new cable are tough, flame and abrasion-resistant Neoprene outer jacket and unique, anti-short breaker strip construction.

Meeting all specifications of the Pennsylvania Flame Test, this Securityflex cable is an investment in safe, continuous mine operation. *Anaconda Wire and Cable Company, 25 Broadway, New York 4, N. Y.*

47452A

### **IDEAL FOR SHUTTLE CAR SERVICE**

Here is a parallel mining cable with ground wire that will stand up under severe abuse: Breaker strip construction cuts short circuits. This cable is ideal for shuttle car service.

**ANACONDA**

*Securityflex*

**CABLE**



# Only 5 Main Parts

**TAKE WEAR IN ALLIS-CHALMERS SOLIDS PUMPS!**

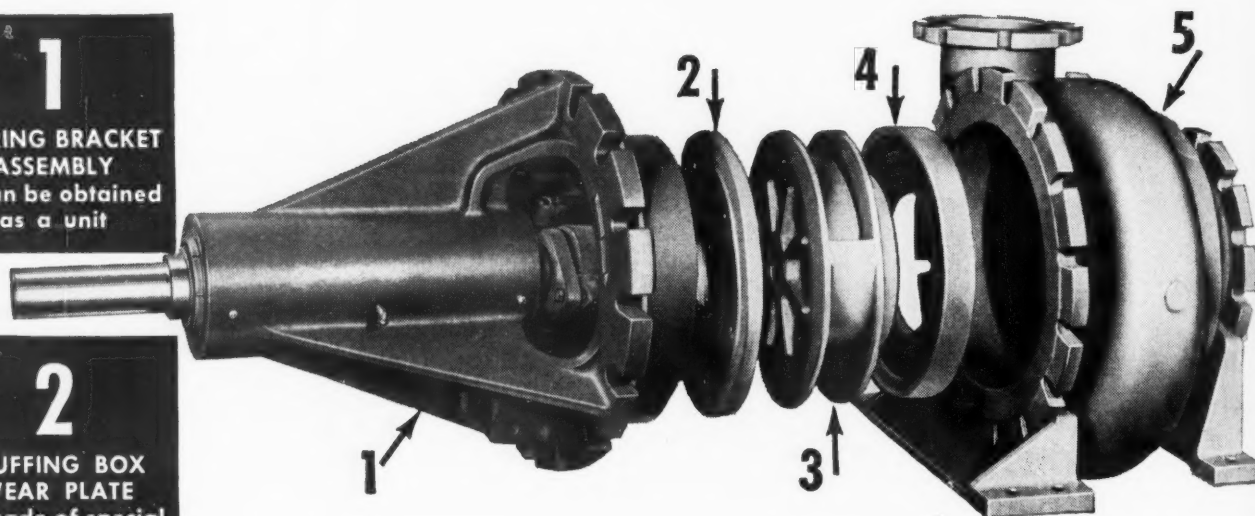
**1**  
BEARING BRACKET  
ASSEMBLY  
— can be obtained  
as a unit

**2**  
STUFFING BOX  
WEAR PLATE  
— made of special  
cast alloy

**3**  
IMPELLER —  
designed to pump  
slurries of various  
consistencies

**4**  
SUCTION WEAR  
PLATE — provides  
easily maintained  
clearance

**5**  
CASING — well  
proportioned with  
heavy metal  
thickness

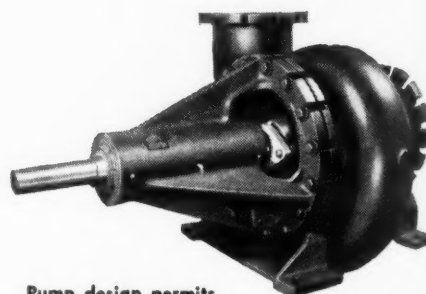


## And that means Savings in Time—Low Replacement Parts Cost—Fewer Parts to Stock!

USERS OF ALLIS-CHALMERS Solids Pumps report parts inventory savings up to 70%! Down time slashed as much as 80%! Remarkable results like these are due to the simple design and the special abrasion-resistant alloy construction of these pumps. ➤ All parts are quickly and easily accessible. ➤ Entire rotating assembly can be removed without disturbing the piping arrangement. ➤ Comparable size pumps of different ratings have interchangeable parts.

Allis-Chalmers Solids Pumps are available in 7 sizes ranging from 175 gpm to 7000 gpm. Ask your nearby A-C office or dealer for additional information or write for bulletin 08B6381B. ALLIS-CHALMERS, MILWAUKEE 1, WIS.

A 2343



Pump design permits quick, easy servicing of stuffing box and adjusting of wearing clearances.



# ALLIS-CHALMERS

One of the Big 3 in Electric Power Equipment—Biggest of All in Range of Industrial Products

**THEY STAND THE GAFF!  
SLASH DOWNTIME!  
PILE UP PROFITS!**

# Firestone TIRES

● When the job is tough, you want tires that do the job without downtime . . . tires that can stand the gaff . . . tires that are always ready to take hold and go . . . Firestone Tires.

Firestone Off-the-Highway Tires today are the strongest, the toughest tires ever built. They are built to produce on the job. They've got what it takes to stay on the job. That's why they pile up profits . . . that's why more equipment is on Firestone Tires than ever before.

If you would cut your operating costs to the bone and increase your profits at the same time, turn to Firestone Tires. Let them prove themselves, on their own, on any job, on all jobs. Firestone Off-the-Highway Tires always come through. They'll come through for you.

*Listen to the Voice of Firestone every Monday evening over NBC*

Copyright, 1947, The Firestone Tire & Rubber Co.

**FIRESTONE OFF-THE-HIGHWAY TIRES**







## This coal isn't going down the drain!

*That river of sludge* you're looking at is going to help make a nice hot fire in someone's furnace this winter.

You see, it consists in large part of powdery fines which accumulate when coal is washed.

For many years there was no practical way to recover these fines. So when the coal was washed they simply went down the drain. And a lot of valuable heat was lost!

Many methods were tried to recover this valuable wasted coal. But all such attempts proved to be either unsatisfactory or very expensive.

Then, Robins engineers tackled this problem. They solved it with the Robins Eliptex Dewaterizer. This new, efficient type of vibrating unit *keeps valuable coal from going down the drain.*

It recovers coal fines as small as  $\frac{1}{8}$ " x 0" . . . removes

surface moisture from coal quickly and efficiently. According to actual users' reports, it leaves as little as 12% surface moisture on these small fines. And on larger-sized coal, even less moisture remains.

**These are remarkable results, when you consider the Robins Eliptex Dewaterizer costs only a small fraction of the price of any other equipment that can do this job!**

And the reason it costs you less is simple. An exclusive elliptical motion and a radically different type of dewatering surface does the job more efficiently. The unit is more compact . . . occupies far less room. Operating costs are unusually low, and maintenance costs are practically negligible.

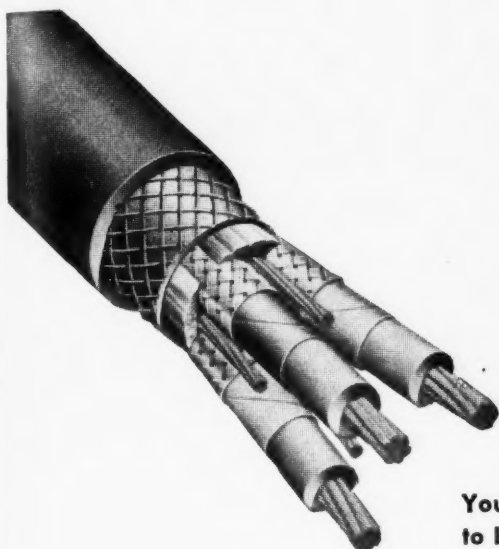
So keep your fines from going down the drain. Use the effective, low cost Robins Eliptex Dewaterizer. For complete information, write Robins today.

Send now for your copy of Robins Bulletin 129. It fully illustrates and describes the new money-saving Robins Dewaterizer.

# ROBINS DEWATERIZER

**ROBINS CONVEYORS DIVISION**  
Hewitt-Robins Incorporated, Passaic, N. J.

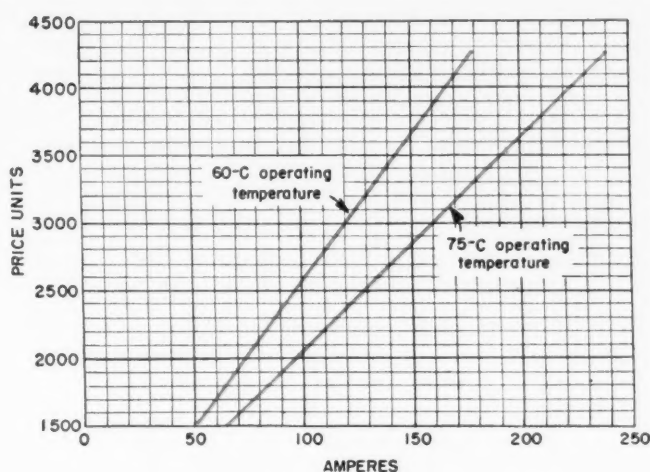




# NOW YOU CAN SAVE UP TO 20% AND MORE ON PORTABLE CABLE PURCHASES

You get greater value per dollar with Geoprene Portable cable. It costs less to buy, and what's more, it lasts longer. Here are the facts:

## GEOPRENE PORTABLE costs less to buy



High-temperature insulation raises current-carrying capacity, permits use of lower-cost, smaller-size cable.

As shown on the graph, which is based on 5000-volt SH-D cables, average savings in first cost are about 19 per cent, based on the smaller cable size which can now be employed on any given job. Current-carrying capacity has been increased appreciably by use of insulation approved for 75-C operation, instead of the 60-C insulation normally used, with no increase in cost.

On larger cables this saving is particularly important, not only in first cost, but in greater handling ease due to the decreased weight and bulk. For example, a shovel previously requiring a 4/0-awg conductor size can now be served by a 2/0-awg cable.

## GEOPRENE PORTABLE costs less to maintain

Most critical factor in portable-cable life is the abuse-resistance of its jacket. And Geoprene\* hits a new high in strength and chemical stability. In standard tests its tear strength is two and one-half times as high as Tellurium, our famous prewar natural rubber jacket. This remarkable resistance to cutting action and abrasion boosts the life and safety of Geoprene Portable well beyond that of an ordinary portable cable. In addition, Geoprene exhibits 105 per cent better aging properties than required by industry specs., and carries Pennsylvania Dept. of Mines Approval P-108 for flame resistance.

When the facts are combined, Geoprene Portable with its 75-C operating temperature offers a double value compared to cables with rubber jackets and 60-C insulations. And it's less bulky, lighter weight, and easier to handle.

May we suggest that you remember this longer life at a lower price the next time you need portable cable. For details, call your G-E representative or write for bulletin GEA-4229. Apparatus Dept., General Electric Co., Schenectady 5, N. Y.

\*Geoprene—special G-E compound containing approximately 60 per cent neoprene, with the balance consisting of plasticizers, accelerators, and reinforcing agents.

**GENERAL  ELECTRIC**

1002-70

# NEW...and far better

## **P&H** "HARTOP" HARD-SURFACING ELECTRODES

### For Weld Deposits that OUTWEAR ALL OTHERS



The family of new P & H Hartop Electrodes is ready—each with a weld deposit job proved to wear longer. There are four types—Hartop Green, Brown, Red and Yellow—for deposits of greater resistance to impact, abrasion, and angular shock. They cover every hard-surfacing requirement in the Rockwell C 35 to 63 range.

#### Easier to Use

You'll find Hartop the easiest hard-surfacing electrodes you have ever used. There's no fight to hold an arc—no arc sputter or fuss. Weld metal goes on soft and smooth, yet wears longer. Hartop ends the slag nuisance—for there isn't any! No cleaning is necessary.

#### Tube Packed!

P & H Hartop Electrodes have a new kind of packaging. They come in handy, reusable 5-lb. tubes—moisture-proof. Strong, lasting containers with metal screw-on caps. Electrode damage and waste are reduced—electrodes stay fresher.

#### SPECIAL TRIAL OFFER

So you may prove to yourself on your work the superiority of P & H Hartop Electrodes—a special assortment of all 4 types, tube packed with complete instructions, is available. This is a limited offer—at the low price of only \$4.25 post-paid—so act now. Mail coupon today!



TAKE ADVANTAGE OF THIS  
TRIAL OFFER



Harnischfeger Corporation  
Welding Division  
4520 W. National Ave., Milwaukee 14, Wis.

Gentlemen:

- ☐ Please rush my trial tube of new better P & H Hartop Electrodes. My check is enclosed:  
☐ Send me literature on the Hartop electrodes.

Name .....

Address .....

City ..... Zone .....

State .....

## P&H

### WELDING ELECTRODES

4520 W. National Avenue  
Milwaukee 14, Wisconsin

## HARNISCHFEGER

WELDING ELECTRODES • MOTORS • HOISTS • P&H • ELECTRIC CRANES • ARC WELDERS • EXCAVATORS

AMERICA'S MOST COMPLETE ARC WELDING SERVICE



DC  
WELDERS



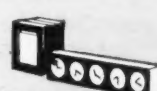
AC  
WELDERS



WELDING  
ELECTRODES



WELDING  
POSITIONERS



WELDING PRODUCTION  
CONTROL SYSTEMS



# It's the **SIDES**

OF A V-BELT

That Really **GET** the **WEAR!**

— ONLY the **SIDES** Touch the pulley!

Diagram of V-Belt in Sheave Groove

## The **SIDES** Do **ALL** the **GRIPPING**

—They Pick Up **ALL** the **LOAD!**

The moment you think about it, you realize, of course, that the *sidewall* is the part of a V-Belt that really gets the wear.

It's the *sidewall* that has to grip the pulley. It has to *pick up* all the power from the driver pulley, transmit that power to the belt as a whole and then, once more, deliver the power to the driven pulley. And the sidewall takes all the wear against the sheave-groove wall.

That is the perfectly natural reason why you have always noticed that the sidewall of the *ordinary* V-Belt is the part that *wears out first!*

## Now See How the Patented **CONCAVE SIDE** SAVES Sidewall Wear—Lengthens Belt Life.

Since the sidewall is the part that wears out first, anything that prolongs the life of the sidewall will lengthen the life of the belt.

The simple diagrams on the right show exactly why the ordinary, straight-sided V-Belt gets excessive wear along the middle of the sides. They show also why the Patented Concave Side greatly reduces sidewall wear in Gates Vulco Ropes. That is the simple reason why your Gates Vulco Ropes are giving you so much longer service than any straight-sided V-Belt can possibly give.

—and the Concave Side is **MORE IMPORTANT NOW** Than Ever Before!

Now that Gates **SPECIALIZED** Research has resulted in Super Vulco Ropes capable of carrying much heavier loads —up to 40% higher horsepower ratings in some cases— the sidewall of the belt is called upon to do even more work in transmitting these heavier loads to the pulley. Naturally, with heavier loading on the sidewall, the life-prolonging Concave Side is more important **NOW** than ever before!

The **CONCAVE SIDE** is a **GATES PATENT**

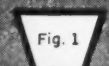


Fig. 1 Straight Sided V-Belt



Fig. 1-A How Straight Sided V-Belt Bulges When Bending Around Its Pulley

You can actually feel the bulging of a straight-sided V-Belt by holding the sides between your finger and thumb and then bending the belt. Naturally, this bulging produces excessive wear along the middle of the sidewall as indicated by arrows.



Fig. 2 Gates V-Belt with Patented Concave Sidewall

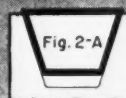


Fig. 2-A Showing How Concave Side of Gates V-Belt Straightens to Make Perfect Fit in Sheave Groove When Belt Is Bending Over Pulley.

No bulging against the sides of the sheave groove means that sidewall wear is evenly distributed over the full width of the sidewall —and that means much longer life for the belt!

4712

THE GATES RUBBER COMPANY DENVER, U. S. A., "World's Largest Makers of V-Belts"

**GATES** VULCO ROPE **DRIVES**



THE MARK OF SPECIALIZED RESEARCH

Engineering Offices  
and Jobber Stocks

IN ALL INDUSTRIAL CENTERS

of the U. S. and  
71 Foreign Countries



make it a

# One-Piece Pipe Line

## with **SILBRAZ\*** joints

Silbraz joints, made with Walseal\* valves, fittings and flanges, actually make a "one-piece pipe line" of brass, copper, or copper-nickel I.P.S. pipe or tubing . . . leaky joints are completely eliminated, and maintenance costs are reduced to the minimum.

A Silbraz joint is *silver-brazed* — not soldered. This modern pipe joint will not creep or pull apart under any condition which the pipe itself can

withstand . . . vibration or corrosion will not affect it. A Silbraz joint is designed to have a tensile strength equal to about three times standard weight brass pipe, and the pipe will fail before the joint will pull apart.

For full information about Silbraz joints made with Walseal valves, fittings and flanges, see your nearby Walworth distributor, or write for Circular 84.

\*Patented — Reg. U. S. Patent Office



Make it a "one-piece pipe line" with Walseal



# WALWORTH

## valves and fittings

60 EAST 42nd STREET

NEW YORK 17, N. Y.

DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

# Kennametal bits costly?



Not when they can cut an average of  
2½ tons of coal for



KENNAMETAL BITS ARE MANUFACTURED  
TO FIT ALL STANDARD MAKES OF CHAINS

U1	Short or Longwall Machines	Cincinnati	Goodman	Jeffrey	Prox	Sullivan	Tracy
U2	Number 50, 52, 54 Chains	—	Goodman	Buddy Sullivan	—	—	—
U3	Mounted Track or Rubber Tired Gage	Cincinnati	Goodman	Jeffrey	Prox	Sullivan	Tracy
U4	Mounted Track or Rubber Tired Gage	Cincinnati	Goodman	Jeffrey	Prox	Sullivan	Tracy
U5	Mounted Track or Rubber Tired Gage	Bowditch, ML Type only	—	—	—	—	—
U6	Mounted Track or Rubber Tired Gage	Cincinnati Duplex	—	—	—	—	—
U7	Mounted Track or Rubber Tired Gage	Cincinnati	Goodman	Jeffrey	Prox	Sullivan	Tracy
U8	Short or Longwall Machines	Cincinnati	Goodman	Jeffrey	Prox	Sullivan	Tracy

## PRICES

CAT. NO.	Prices Each in Lots of		
	\$0-99	100-499	500 or more
U1	\$1.15	\$1.05	\$.95
U2	1.15	1.05	.95
U3	1.15	1.05	.95
U4	1.15	1.05	.95
U5	1.30	1.20	1.10
U6	1.30	1.20	1.10
U7	1.35	1.25	1.15
U8	1.35	1.25	1.15

# KENNAMETAL

MINING DIVISION

KENNAMETAL INC., LATROBE, PA., U. S. A.

Some examples where the coal seam is medium hard to hard are:

*Washington County, Pa., Pittsburgh Seam:*

Bit cost per ton of coal mined — .4 of one cent.

*Somerset County, Pa., "B" Seam:*

Bit cost per ton of coal mined — .36 of one cent.

*Harrison County, W. Va., Pittsburgh Seam:*

Bit cost per ton of coal mined — .98 of one cent.

*At the Brownfield Coal Co., Moxahala, Ohio, No. 6 Seam,*  
the bit cost per ton of coal mine was reduced from 12 cents to 1 cent.

There are other ways Kennametal bits help to reduce the total cost of cutting coal. Fewer bit changes are required and fewer men are needed to sharpen, handle and haul bits to and from the face. Less time is wasted changing and resetting bits. The machine operates at lighter loads—lasts longer—cuts faster—because the hard, wear-resistant Kennametal cutting edge stays sharp long after steel bits dull.

In seven out of ten cases cuttings are larger . . . less "bug dust" is formed.

Despite the fact that Kennametal bits are priced at between \$.95 and \$1.35, depending on size and quantity, they lower cost in terms of less labor, less maintenance on machines, lower power cost, and increased mining efficiency.

A Kennametal representative will be glad to contact you for a demonstration. Simply write Mining Division, Kennametal Inc., Latrobe, Pennsylvania.



14  
from  
33

# No. 1

IN THE COAL INDUSTRY BECAUSE  
IT'S A-1 IN PERFORMANCE

# JOY

## EQUIPMENT

"The World's Most Complete Line of  
Modern Mining Equipment"

Consult a Joy  Engineer

14-BU—Designed for high production in low veins. Made in 30½", 33" and 36" heights.



**JOY LOADERS INCREASE TONNAGE, LOWER COSTS**

11-BU—Heavy duty, for seams 60" or more in height. Rated at 5 tons per minute; capacity 10 tons per minute.



**JOY MANUFACTURING CO.**

GENERAL OFFICES: HENRY W. OLIVER BUILDING • PITTSBURGH 22, PA.



# A PAYING PARTNERSHIP....



# BIG

## EQUIPMENT *and*

Day after day in giant stripping operations all over the country you'll find Primacord teaming up with big equipment to lay the groundwork for better, faster production.

Primacord trunk line hookups can be planned so that front holes "go" a split-second before succeeding holes — when a shot is fired this relief of burden boosts fragmentation. Primacord branch lines down the holes are in contact with every cartridge — when a shot is fired, every cartridge detonates with full power. Result: a combination

# RIMACORD

of forces doing a job that keeps overburden yardage up — costs down.

Insensitive to stray currents, Primacord is the logical detonator to use wherever high-voltage electrical equipment is on the job. Use it to keep expensive shovels, drag-lines, bulldozers and trucks on the move — paying their way. There's a type of Primacord to meet every stripping or blasting need. Write us direct, or ask your Explosives Company for the full Primacord story.

**THE ENSIGN-BICKFORD CO., SIMSBURY, CONN.**  
Also Ensign-Bickford *Safety Fuse* • Since 1836

P-17



DECEMBER, 1947

IVAN A. GIVEN, EDITOR

## Unfinished Business

WITH THE DEBATE on the Marshall program, now becoming known as the European Recovery Program, entering into the serious stage in Congress and elsewhere, perhaps the most-needed thing of all is a down-to-earth analysis of what the program involves and what it means to the United States citizen and business man. Such an analysis, prepared by the McGraw-Hill Department of Economics, appears elsewhere in this issue. It concludes that carrying out the program on anything like the proposed scale will cost the United States considerable money and will increase the magnitude of some of its difficulties—at least for a time. It also concludes that the rewards will be more than worth the cost.

Coal, not unexpectedly, is a vital element in the program. In spite of considerable calamity howling about shortages—mostly, it appears, by the uninformed or axe-grinders—it seems certain that the United States can supply what is needed when and if the program is worked out—assuming no new and lengthy work stoppages. But coal companies and coal-mining men of all ranks, as well as their customers, will be called upon for the taxes necessary to defray the cost of the program. Also, since many of the things Europe needs to get back on its feet and stave off the march of totalitarianism are things the United States coal industry also needs and wants, the industry may find itself in an even tighter scramble for equipment and materials. Finally, the industry has the problem, among others, of preparing for the readjustments that may be necessary when exports—as they will—recede from their present record levels.

Helping Europe get back on its feet is no small task. But if the United States is to achieve the objectives for which it fought in two world wars, it must consider the present European situation unfinished business. The first step—that of getting started—is a big job in itself. It alone requires the maximum in understanding and execu-

tion to the end that the program is carried out at a minimum in cost to yield with the maximum in benefits, not only to Europe but to the United States. Completing the program, once the first step is taken, involves uncertainties and not a few risks. But, to repeat the conclusion of the McGraw-Hill Economics Department, "the assets outbalance the liabilities."

## Added Reason

SINCE COAL in the ground is commanding substantially higher prices, there is even more reason for contending that it is becoming too costly to leave. Along with increasing cost, the thicker, better-quality seams are becoming less plentiful as time goes on, especially in the territory serving the major markets of the East, South, Middle West and Northwest. For that reason, increasing the percentage of recovery is becoming more vital. As a result, pillar mining merits additional study, not only in areas where it already is general practice, but in other regions where it is not. A necessary parallel is increased emphasis on salvage operations both in recovering coal values formerly left in the mine and those frequently found in picking-table or cleaner reject and in silt, slurry and sludge.

Like everything else, realizing the most in pillar mining requires careful, thorough study of the problem to arrive at the method offering the greatest assurance of low cost with safety. Mechanical-mining equipment is not necessarily a drawback in increased recovery through more or better pillar mining. In fact, it has a number of advantages, one of them being speed, while a newly developed auxiliary—the timbering machine—provides a means of getting better roof support at a lower cost. When coupled with good preparation methods, more and better pillar mining and other steps toward higher recovery offer even greater benefits today.

yard-  
is the  
voltage  
o keep  
trucks  
a type  
lasting  
loaves  
ONN.  
1836  
P. 17

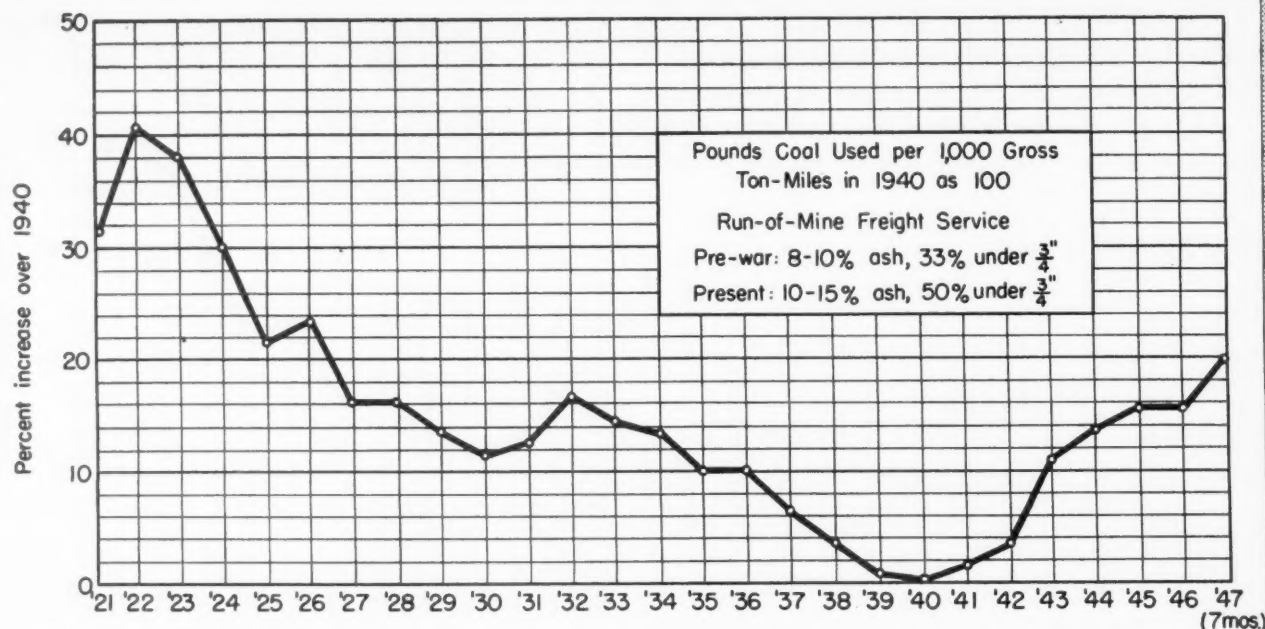


FIG. 1 — INCREASED CONSUMPTION of coal by steam locomotives per 1,000 gross ton-miles since 1940 reflects, among other things, higher ash content and a larger percentage of fine sizes.

# Coal on the Locomotive

**Immediate Action Necessary to Curb Diesel Growth—  
Production and Shipment of Coal Better Suited to Locomotive Use Required to Match Work Being Done to  
Improve Efficiency of Steam Motive Power**

By EARL C. PAYNE

Consulting Engineer, Pittsburgh Consolidation Coal Co., Pittsburgh, Pa.

LAST YEAR it was my pleasure to address the National Coal Association in Cleveland on the subject of "Locomotive Fuel Competition." Many were quite complimentary concerning my proposal to establish regional locomotive-fuel standards covering quality, uniformity and size—standards which would be recognized by both the coal industry and the railroads as insuring the proper coal for locomotive use. Several producers stated publicly, although somewhat reluctantly, that "something must be done." However, here we are in Chicago, 19

Abstract of an address before the convention of the National Coal Association, Chicago, Oct. 16-18. Mr. Payne also is chairman of the motive-power committee, technical advisory board, Bituminous Coal Research, Inc.

months later, passively snoozing in the rose bed of scarcity which is fertilized by the car shortage.

We have done very little to improve the competitive position of coal as a locomotive fuel in the past two years. The coal industry undoubtedly wants to retain the coal fuel market, but it would seem that we are sulking because the railroads are buying so many diesels rather than taking constructive action to stop the trend. Responsibility for initiating a long-range railroad fuel program rests with coal producers as the sellers, even though it may be somewhat difficult under present conditions to think of our future competitive markets when our talents are directed largely toward distribution diplomacy. It is quite

possible that, with a 100-percent car supply instead of the present deficiency, we would have coal running out of our ears. For that reason the subject of locomotive fuel is again brought up, with the hope that the coal industry may do its part to improve the availability and lower the over-all operating cost of coal-burning steam motive power.

Table I brings up to date locomotive trends discussed at the Cleveland meeting. From 1920 to 1946 the number of steam locomotives has decreased almost 27,000, which is a loss of 42 percent. Two years ago the loss was 38 percent. The total tractive effort of the steam locomotives is now 323,000,000 lb. less than in 1920—a loss of 13.8 percent as compared with the 10.4-percent loss of two years ago.

## Diesel Power Skyrocketing

The number of diesels in this period has increased from zero to 4,441. The tractive effort represented by them is up to almost 248 million pounds, or 46 percent more than the tractive effort of all diesel locomotives in service just two years ago. Table I also shows a rapidly increasing percentage of road locomotives being installed. Two years



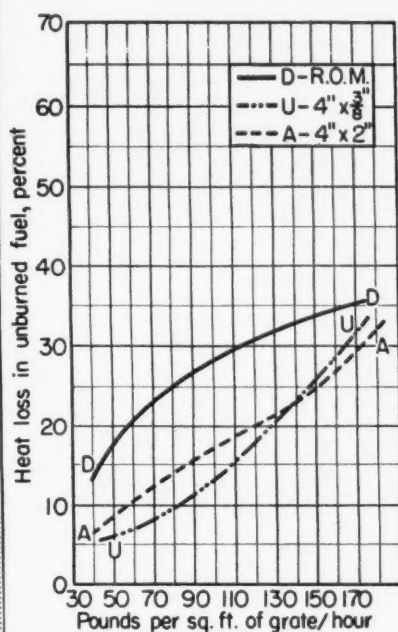


FIG. 2—HOW LOSS of coal as unburned carbon is affected by size.

## Locomotive-Fuel Picture in Eight Major Regions

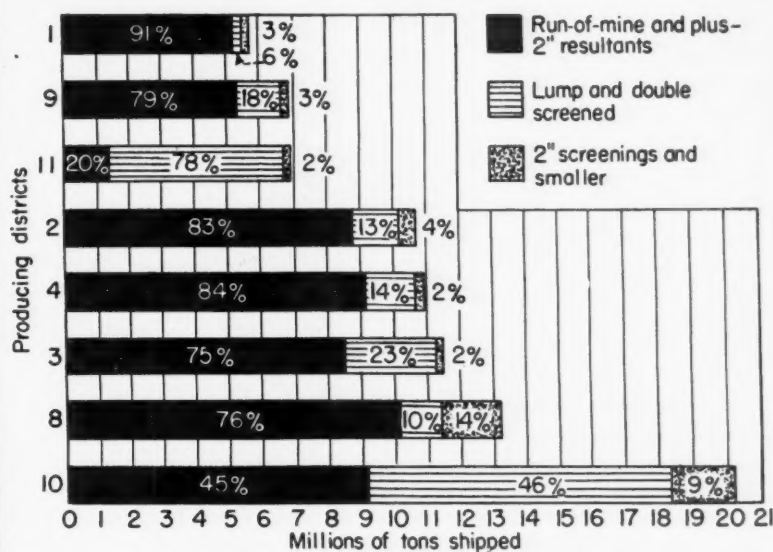


FIG. 3 — LOCOMOTIVE-FUEL shipments by tonnages and sizes from eight districts in the twelve months ending Sept. 30, 1946.

## Front

ago the diesels were practically all switchers, whereas today almost 60 percent placed in operation are for road service. These big passenger and freight diesels displace coal tonnage fast.

### One Diesel for 2-2½ Coal Units

One of our large railroads retires 2 to 2½ steam locomotives for each road diesel placed in service. The annual coal requirement is reduced 18,000 to 20,000 tons if this diesel is placed in passenger service, and the loss is 27,000 to 30,000 tons if the engine is placed in freight service. The coal industry well knows that industrial consumers using 20,000 to 30,000 tons annually are relatively scarce and very attractive. The producer doesn't shrug off the loss of an industrial account of this size, and it would seem that he should put up a fight to prevent the continued loss of these coal-burning locomotives in freight and passenger service, which have been burning about 85 percent of the total locomotive fuel used by the railroads. May I hear it said—a little stronger this time: "Something must be done."

Fig. 1 suggests a place to begin. It shows the trend in pounds of coal

Table I — Motive-Power Trends

	Steam Locomotives		Diesel Locomotives		% Switchers
	In Service	Installed	In Service	Installed	
1920.....	64,382	4,037 <sup>1</sup>	.... <sup>2</sup>	... <sup>2</sup>	...
1925.....	63,612	1,733	5	... <sup>2</sup>	...
1930.....	55,875	782	89	4 <sup>3</sup>	...
1935.....	45,614	36	138	15	...
1940.....	40,041	120	822	281	82.4
1944.....	39,681	326	3,068	918	73.2
1945.....	38,853	115	3,816	786	67.2
1946.....	37,551	86	4,441	615	52.7
1947 (7 mos.).....	....	....	....	...	42.1
1947 (8 mos.).....	....	63	....	470	...
On order, Sept. 1, 1947.....	....	40	....	807	...

	Steam Loss, 1920-1946	Diesel Gain, 1920-1946
Number.....	26,831 (42%)	4,441
Traction effort, millions of pounds.....	2,341-2,018 (13.8%)	248-1.2 (20,567%) <sup>4</sup>

Sources: A. A. R., N. C. A. <sup>1</sup>1923. <sup>2</sup>Not available. <sup>3</sup>1932. <sup>4</sup>1929-1946

Table II — Locomotive-Fuel Trends

	Tons Used	Percent Production	Pounds of Coal per 1,000 Gross Ton-Miles	
			Coal Equivalent Freight Loco's	Freight Coal, Steam Loco's
1920...	135,000,000	23.8	165	165*
1925...	118,000,000	22.7	140	140*
1930...	98,000,000	20.9	121	121*
1935...	77,000,000	20.7	118	121**
1940...	85,000,000	18.4	112	115
1945...	124,200,000	20.8	115	123
1946...	110,400,000	21.4	116	124
1947***	....	...	...	127

Source: I. C. C. reports. \*Estimated same as equivalent. \*\*1936. \*\*\*7 months.



## SOME REASONS FOR STEAM-LOCOMOTIVE SERVICE FAILURES

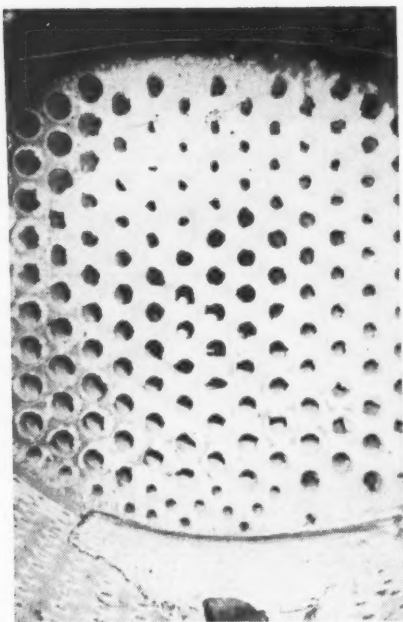


FIG. 4—Slagged flue sheet.

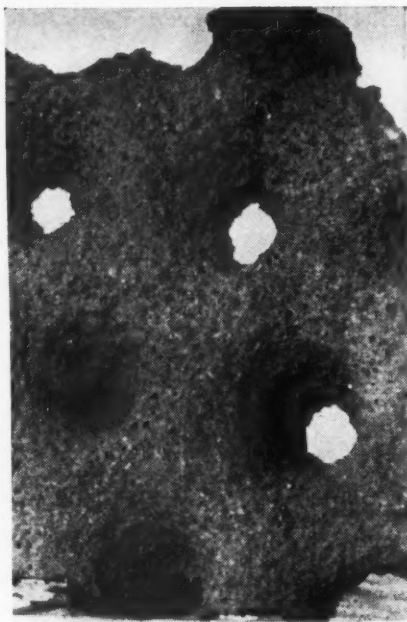


FIG. 5—Honeycomb from back flue sheet.

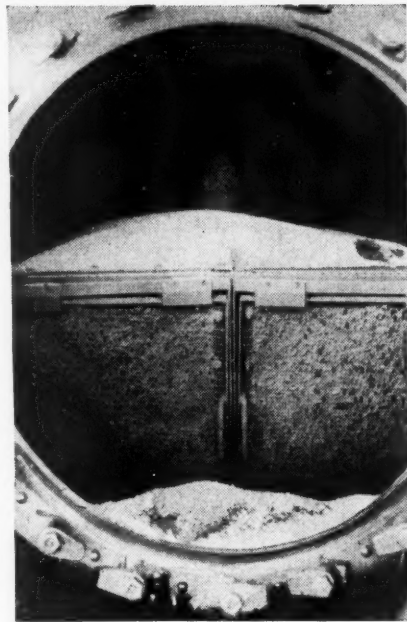


FIG. 6—Plugged front end.

per mile required to haul 1,000 gross tons of freight, based on the performance since 1921 of one of our large railroads burning run-of-mine coal in freight service. The low figure for coal used per 1,000 gross ton miles was in 1940 and is taken as 100 percent. From 1921 to 1940 the trend was downward, showing consistent improvement from better traffic management and the modernization of steam motive power and auxiliary equipment. During this period the ash content of the coal ranged from 8 to 10 percent, and the size consist of the run-of-mine (which was largely hand-loaded) was approximately 33 percent minus  $\frac{3}{4}$  in.

### Coal Quality Worse

Since the war the fuel available for locomotive use has been gradually getting worse. This is very vividly reflected in the curve since 1940, which shows a rapid increase in the pounds of coal per 1,000 gross ton-miles, including the first seven months of 1947. Consumption is now 20 percent above that of 1940. The ash content of the coal this railroad is now using is 12 to 15 percent and the run-of-mine (now largely mechanically-loaded) is about 50 percent minus  $\frac{3}{4}$  in. This is an increase of 50 percent in the percentage of the less desirable fine coal. Today, over 40 percent of this locomotive fuel is coming from strip pits, many of which are like the mule—no pride of ancestry nor hope of posterity.

While the monthly buying of railroad fuel is going on, the utilities

are protecting their rapidly increasing requirements, and the export market is a green pasture which is getting some of the better quality coals. Perhaps the railroads cannot forget the days when the producers ran to them with surplus lump, egg and other double-screened coals and received their permission to apply these premium sizes on their locomotive orders at the run-of-mine price. This unwholesome situation will not get better without joint long-range railroad-fuel planning by the management executives of both the producers and the railroads.

### Coal Performance Down

The trend just shown for one railroad also is reflected in the I.C.C. figures for all Class I railroads. In Table II, it will be observed that the best performance also was in 1940: 112 lb. per 1,000 gross ton-miles for all freight locomotives. Other fuels were converted to their equivalent in pounds of coal. The right-hand column shows coal for steam locomotives only, and the figures are larger than those in the column of coal equivalents. For the first seven months of 1947 the average for coal only is 127 lb., or the same as it was 20 years ago. This is not the time to fill the air with the reasons why the coal industry is not responsible for the present situation, and why its skirts are clear of all blame. Rather, it is the time to start long-range mutual planning to correct the trend.

Now, just a word about this at-

tractive utility tonnage. New and modernized power plants of both utilities and industrials now are being equipped with up-to-the-minute combustion equipment designed to burn coals varying widely in quality. This built-in flexibility permits the use—under normal condition—of the best B.t.u. value available, regardless of size or other physical and performance characteristics. In these new plants the size of the coal usually has little or no influence on the utilization value. Slack—at a slack price—is their hearts' desire. With this situation, isn't it a crime to give them run-of-mine or resultants, which contain stoker, nut or egg sizes, when these components have premium-size value in excess of their B.t.u. value to other consumers who really need this type of coal?

### Cultivate R.R. Markets Now!

When the buyers' market returns, competitive selling will remove these premium sizes from much of the tonnage for generating steam, provided, however, that a market still is available for these sizes. In my opinion, the railroads need these double-screened sizes *now*, and in the *future* the coal industry will need this railroad fuel market for the plus 1- to  $1\frac{1}{4}$ -in. coal. Today, these large utility and industrial plants should be burning the mule coal, because their equipment is suitable for its use, while Fig. 1 and Table II show vividly what is happening when less suitable coal is used by the railroads.

It is true that the railroads don't

know what size of double-screened coal they want. Every operating man wants better quality, uniformity and less fines. Several months ago a cooperative test program was proposed which would establish tangible performance values for double-screened sizes as compared to run-of-mine from the same mine. The plan failed to receive the unanimous approval of the proposed financial backers. Much was accomplished, however, because four of our larger railroads were convinced of the need for this basic information and have begun limited test programs of their own. They have told me, however, that they would have preferred to do the job on a cooperative basis, because the information could have been obtained more quickly and cheaply under the plan suggested.

### Less Fines Helpful

Before concluding this double-screened coal discussion, a few brief facts will be presented. Fig. 2 shows three curves representing the unburned carbon loss for three sizes of coal at burning rates of 40 to 170 lb. per square foot of grate per hour. The "D" curve shows the losses for run-of-mine, which range from 12.5 to 35 percent. The "A" and "U" curves show the losses with 4x2- and 4x 3/8-in. egg sizes. At a reasonable burning rate of 100 lb. the unburned carbon loss for 4x2-in. egg is 11 percent lower than that with run-of-mine, while the loss with 4x 3/8-in. egg is 14 percent less.

These figures are tangible evidence of the improvement in locomotive performance obtained by the removal of the fine coal. In addition, there are many intangible savings which are difficult to evaluate. Uniformity of quality and size, lower ash, higher B.t.u. and practically no foreign matter in the coal all result in lower maintenance, fewer cut-outs and fewer steam failures as a result of slagging, clinkering and plugged flues and netting. Excessive fines in locomotive fuel not only cause a fly-ash public nuisance, but also result in excessive maintenance and many steam failures. This improved performance increases the availability of steam motive power—a critical factor in competition with the diesel.

Fig. 4 shows a slagged flue sheet. Fig. 5 is honeycombed slag pried off the rear flue sheet. Fig. 6 shows a plugged front end. To minimize the steam failures caused by these

conditions, improved preparation and quality are required, and if the coal industry fails to make these changes, they are encouraging the railroads to convert to motive power using competitive fuel.

Fig. 3 shows that more than two-thirds of the locomotive fuel shipped from Producing Districts 1 to 11 was run-of-mine during the 12-months period ending Sept. 30, 1946. There is little doubt that this 61,000,000 tons of run-of-mine was inadequate to meet the present demands of steam motive power. In my opinion, less than 10 percent of the 90,000,000 tons shipped for locomotive use was the best available size for this purpose.

Double-screened coal for engine fuel from every mine is not necessary for acceptable results. Some mines can furnish acceptable quality, uniformity and satisfactory performance without removal of the fines. Frequently the ash-softening temperature and the burning characteristics of coal containing a high percentage of slack are no serious handicap in obtaining acceptable results. There is, however, an irresistible public demand for reduction of stack emission of smoke and fly ash, and this eventually may force the railroads to use every available means to reduce the stack loss of cinder and unburned carbon. A very good way to improve conditions is to put less fines in the firebox.

### Coal to Supply Other Fuels

It is estimated by the Bureau of Mines that the reserves of solid fuel in the United States are sufficient for this country's needs for the next 3,000 to 4,000 years at the present rate of consumption. This energy backlog eventually will be the source of all solid, liquid and gaseous fuel. There is, however, no general agreement on the deadline when the conversion of coal into oil and gas will be absolutely necessary. There is, in fact, little concern among the general public over our fuel reserves and our industries are making very little preparation for the day of reckoning.

Known oil reserves in the United States in 1935 totalled 12.4 billion barrels. To this, six billion barrels from newly discovered pools has been added. The accumulated withdrawals during the period 1936 to 1946 were 15.6 billion barrels, or only 2.8 billion barrels less than the reserves originally estimated (18.4 billion barrels). The production projected for 1948 is 2.2 bil-

lion barrels, and we would now be in one hell of a jam were it not for additions to reserves as a result of revised production estimates and extensions to old fields. The estimated reserves now stand at 20.9 billion barrels, and with the terrific increase in demand for gasoline and light oils, one can easily understand why many experimental plants are now projected to produce synthetic liquid fuel from natural gas, oil shale, lignite and bituminous coal.

### Synthetic-Oil Plants Huge Task

The early success of these experimental plants is by no means assured and their production capacity is hardly a drop in the bucket compared with the demand. After commercial processes are established by this experimental work, the physical and financial task of building these tremendous synthetic oil refineries will resemble the job of mobilizing the resources and money required for the second world war. Undoubtedly our country will be dependent for many years on imported oil. It is not difficult to guess what will happen to these imports in any national emergency of the near future.

The Bureau of Transport Economics and Statistics of the I.C.C. has just released a report on "Post-War Levels of Demand for Transportation Fuels Compared with Reserves." The breakdown of this transportation demand is as follows:

Passenger autos . . . .	47%
Trucks . . . . .	17%
Railroads . . . . .	12%
Shipping . . . . .	8%
Peacetime army . . .	8%
Civilian aviation and non-highway uses	8%

If we, as a nation, continue the unbridled installation of domestic oil burners, diesel locomotives and oil-burning prime movers for stationary service, without giving full consideration to the future supply of natural petroleum, then it is my considered opinion that we are headed for trouble. In the last war the railroads carried almost the entire transportation burden with coal-burning steam motive power. I shudder to think of the mad scramble for oil fuels in a future national emergency when limited supplies would be allocated to the Army, Navy, the Air Force, self-propelled projectiles, domestic heating, trucks, automobiles, commercial aviation, stationary power plants and then—on top of this—



a greatly increased oil demand by the railroads for new diesel locomotives. In passing, isn't it also a crime to burn this scarce and valuable oil in stationary power plants for the generation of steam? How would the country come out in transportation after the railroads have scrapped 2½ steam locomotives for each road diesel placed in service?

Possibly the government should undertake to preserve these locomotives in storage, as they are now doing with surplus Navy ships, just in case. Better still, it would seem that the time has arrived when fuel planning on a national scale should be undertaken with the cooperation of the fuel industries, as a protective measure in the interest of our entire country's welfare.

### "National Fuel Policy" Needed

There should be a pooling of the broad knowledge and experience of competent personnel in the U. S. Bureau of Mines, together with intimate knowledge and experience of competent representatives of the petroleum, natural and manufactured gas, and coal industries and the new synthetic fuel industry now being developed. Well-known representatives of each industry should be chosen to constitute a "National Fuels Planning Board" under the Department of the Interior. This Board should have the responsibility of formulating a long-term "National Fuel Policy," based on the facts developed from their joint investigations. The public is entitled to know where we stand and factual data should replace the prattle of the optimists. Then, confidence would replace the uncertainty and confusion which comes with each new statement from individual companies and groups.

The coal industry, through Bituminous Coal Research, Inc., is supporting a research program for the improvement of steam locomotives. The motive-power committee of the technical advisory board supervises the projects for which funds are allocated to improve the competitive position of the conventional coal-fired steam engine. The author is chairman of this committee. Before discussing our work in BCR, I have chosen to analyze the unfavorable locomotive fuel conditions which individual coal producers *must do something* about if our efforts toward scientific improvement of the locomotive are not to be completely nullified. The loco-

motive research projects which will be described later are progressing satisfactorily, but our success will be delayed and our over-all objectives cannot be attained unless these unfavorable locomotive fuel conditions are corrected. The research money for these projects is not being wasted, but it is very discouraging when one realizes that the best we can do will not be good enough unless we have help to obtain more suitable locomotive fuel.

### Coal-Industry Projects

The motive-power committee met at Chicago Oct. 14 to prepare recommendations covering the projects which should receive our attention during the coming year. The projects which have been previously approved are:

A-2—Locomotive air supply.

A-3—Over-fire air jets.

A-4—Effect of fuel on locomotive performance.

A-5—Handling locomotive coal to minimize breakage and segregation.

A-7—Cinder collection and disposal with steam-nozzle front end.

A-8—Steam locomotive performance.

A-9a—Abrasion-resisting induced-draft fan for locomotives.

A-9b—Cinder collection and disposal with induced-draft-fan front end.

**Locomotive Air Supply**—During the past year our research engineers have cooperated with several of the railroads in the application of the Mansfield under-grate air distributor. Test results indicate that an over-all increase in locomotive efficiency of about 7½ percent can be reasonably expected. There also has been an improvement in smoke production, fly-ash emission and clinkering of the ash. The merits of the device have been proven to the extent that the Standard Stoker Co., Erie, Pa., has undertaken the commercial manufacture, sale and application of this device to coal-fired steam locomotives.

**Over-Fire Air Jets**—Over-fire air jets have now been perfected to a point where over 2,000 locomotives have been equipped to improve their smoke performance. The merits of this device also have been proven to the extent that we are now working out an agreement with a large railway supply company that plans to manufacture, sell and apply these air jets to railway locomotives. Practically all of the new steam locomotives installed on the

railroads this past year have been equipped by the builders with steam-air jets.

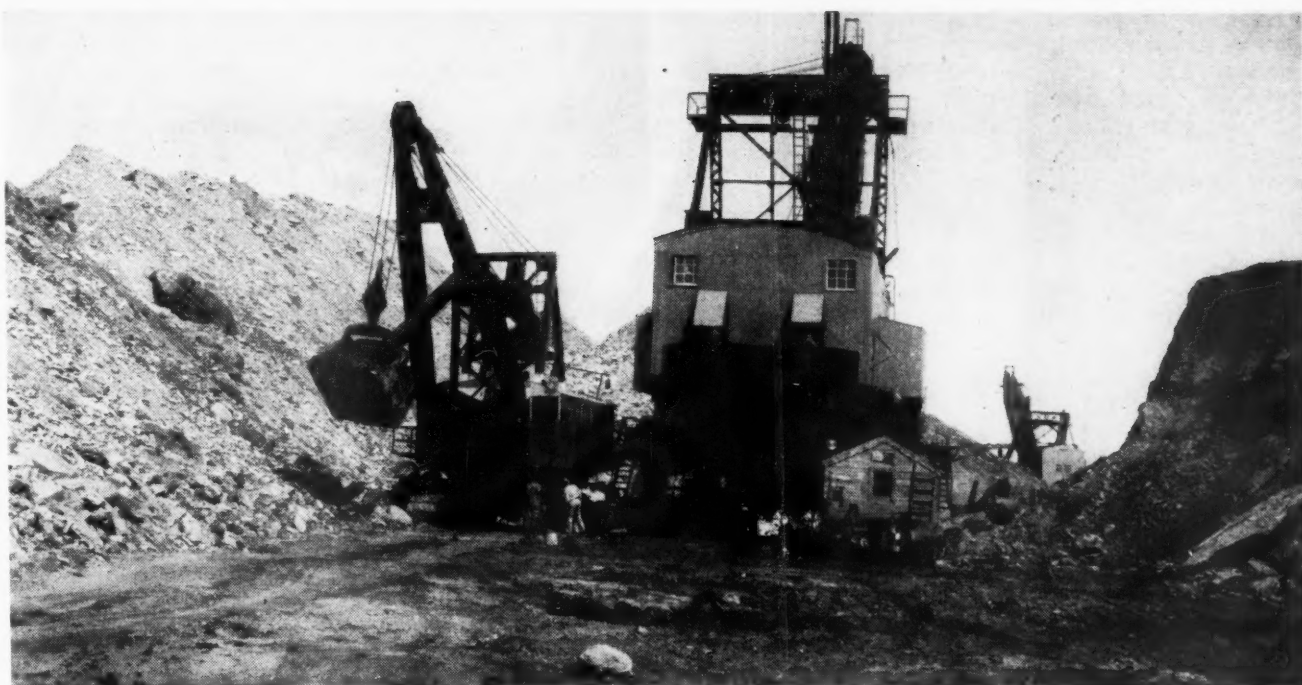
**Effect of Fuel on Locomotive Performance**—This research project, and that covered by A-8 (steam locomotive performance) have been largely devoted to a study of the performance of various sizes of coals which have been tested by a couple of the railroads. We expect to encourage test programs of this kind and will assign research engineers to cooperate with the railroads to establish reliable performance data on the various grades of coal being used for locomotive use.

**Handling Coal to Minimize Breakage and Segregation**—Nothing is contemplated on this project during the coming year. Several of the railroads have built modern coaling stations during the past two or three years, and the manufacturers of this equipment fully realize the need for minimizing the breakage and segregation of the locomotive fuel handled. Funds are so limited that we are now concentrating on other projects, and will delay intensive work on this problem until some future time.

**Front-End Improvement**—Projects A-7, A-9a and A-9b all are related to the problem of improving the front end of the locomotive. Cinder collection and disposal with the steam-nozzle front end, abrasion-resisting induced-draft fans for locomotives and cinder collection and disposal with the induced-draft front end are individual studies which we consider of major importance in improving locomotive performance. We have cut down the smoke to acceptable limits with over-fire jets, and it now becomes necessary to reduce the cinder emission to acceptable limits.

The unburned carbon normally passing out of the stack is a loss which we hope to minimize by collection and reburning. The mechanical-draft induced-draft front end developed by the engineers of the Norfolk & Western Ry., Standard Stoker Co. and the L. J. Wing Co., has excellent possibilities. A switcher locomotive so equipped, including automatic controls, has been operating successfully for some time. It will be followed by two others and, possibly, the equipment will later be applied to road locomotives. We are cooperating in this development and hope that a year from now we can report that some of our work on this project, which is still in the laboratory, is in successful use on both switchers and road locomotives.





ON THE JOB IN THE NEW PIT—the new 7½-cu.yd. loader is shown passing one of the reconditioned and re-erected strippers.

## Strippers Moved 12 Miles

**Dismantling, Reconditioning and Re-Erection of Two Strippers and One Loader Accompany 12-Mile Move by Rail and Truck at Midland Electric Mine — New Loader Replaces Old—Transfer Station Built**

By W. E. PARKS

Editor, Mecco News, Midland Electric Coal Corp., Farmington, Ill.

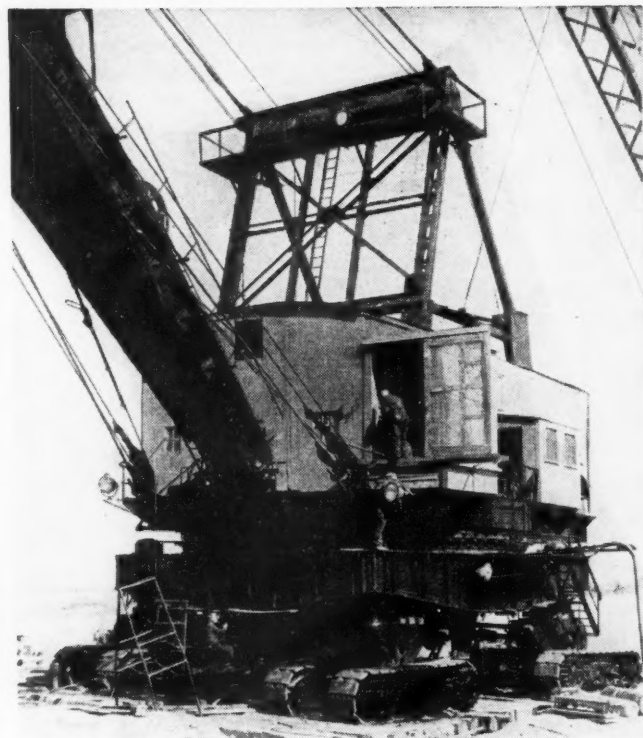
FOLLOWING one of the largest mass moves of equipment ever undertaken in the region, accompanied by thoroughgoing repair and reconditioning and the addition of a new loading unit, equipment employed in stripping and loading the No. 2 vein at the Mecco No. 1 mine of the Midland Electric Coal Corp., Atkinson, Ill., is now proving itself in the recovery of the No. 6 vein at a new location near Mineral, Ill., some 12



RE-ERECTION SITE, showing spur track and 100-hp. electric derrick. A similar derrick was used for dismantling at the old pit.



HEAVY SHOVEL PARTS were unloaded from cars arriving on the spur track and were moved into place by the derrick.



REPLACEMENT AND REHABILITATION of worn parts to put shovels in top condition were part of the re-erection process.



30-TON HAULAGE UNIT passing one of the stripping units in the new Mineral pit.



TRANSFER STATION at the new pit—first stage in rail movement to the tipple.

miles east of the old pit. The preparation plant and mine office, however, were left in their original location at Atkinson, the coal being brought in by rail from a transfer station at the new pit.

Operations at the old pit in the No. 2 vein, some 30 in. thick, started in 1929. The last coal was loaded Nov. 12, 1946, ending some 17 years of continuous operation, during which more than 152,000 railroad cars of coal was shipped. With the time when the No. 2 vein would work out approaching, much planning and careful thought were devoted to moving the stripping and loading units, consisting of the following: the original Marion 350 stripper with 8-cu.yd. dipper, 90-ft. boom and 64-ft. dipper handle; Marion 5480 stripper with a 15-cu.-yd. dipper, 94-ft. boom and 67½-ft. handle; Marion 490 loader with 4-cu.yd. dipper, 32-ft. boom and 19-ft. handle; one small Northwest dragline and miscellaneous equipment.

Since the distance of some 12 miles the equipment was to be moved was considered too great for moving the heavy stripping equipment under its own power, the decision was to dismantle the shovels and ship them to the new location by rail and truck. An additional—and even more important consideration—was the fact that the 350 and 5480 strippers, as well as the 490



loader, had been in operation a long time and dismantling would provide an opportunity for replacing worn parts and adding new equipment. In anticipation of the move the management began placing orders for the new parts in 1945. For the most part, deliveries started about 6 months after the orders were placed. Consequently, everything was on the ground when the first unit arrived at the new location.

Weights of the three shovels were as follows: 490 loader, 120 tons; 350 stripper, 600 tons; 5480 stripper, 1,200 tons. Between 1937 and 1946 the 350 unit handled approximately 23,700,000 cu.yd. of overburden at the old pit. Production for the 5480 stripper—1929 to 1946—totalled 79,200,000 cu.yd., making the total for the two units 102,900,000 cu.yd.

Weights involved in the move included the following: 350 stripper—dipper, 18,000 lb.; boom, 125,000 lb.; handle 34,000 lb.; crawler side frame only, complete with belt, 43,000 lb.; outside girders, 18,000 lb.; 5480 stripper—dipper, 41,400 lb.; boom, 200,000 lb.; handle, 58,000 lb.; crawler side frame only, complete with belt, 45,000 lb.; outside girders, lower base, 23,000 lb.

### Many Parts Moved by Truck

The majority of the shovel parts, except handles, booms, dippers and certain other heavy elements, which went to the new location via rail, were moved by truck. The one small dragline also was trucked without dismantling. Truck equipment employed in moving included 30-ton semi-trailers and 5-ton dump-bed trucks.

To handle dismantling and rebuilding, derricks were erected at both the old and new locations. Mast heights were 110-ft.; boom lengths, 100 ft. The derricks were powered with 100-hp. electric motors, had capacities of 40 tons each and included  $\frac{3}{4}$ -in. boom and hoisting cables and power swing. This equipment was vital in lifting and moving heavy parts.

Dismantling of the 350 stripper got under way in July, 1946. Extra men were employed so that work could go ahead around the clock. A specialist in such work was assigned to the job by the Marion Power Shovel Co. Harry Brentz, Midland Electric master mechanic, was on the job at all hours and the combined efforts of the men involved resulted in completion of the job with a minimum of delay. About 20 men were employed on the first

shift, 17 on the second and eight on the third. About 60 working days were required for the dismantling and re-erecting job.

The dipper handle and dipper came off first. Then the boom was removed and placed on cribs. Next, the house was dismantled, the A-frame taken down and the machinery removed. Then, the upper and lower frames were dismantled, leaving little but the four "cats." These were shipped to the new location intact in trucks.

Complete dismantling of the shovel made it possible to use trucks for moving most of the parts to the new field. The spur track from the Rock Island line was completed to the new pit location at this time and the major pieces, such as the boom, dipper handle and dipper were forwarded by rail.

As the shovel parts arrived at the Mineral location re-erection got under way. In general, the order in re-erection was the reverse of dismantling. New parts and equipment were added to replace those considered too worn for retention. Included were new double deck plates, top chord angles on all diagonal beam and outside girders, center journal, front beams on revolving frame, hoist drums, roller circle and rails complete, plus many other smaller items. The re-assembled shovel was ready for operation and began stripping Oct. 7, 1946.

While the 350 shovel was being re-erected, the small dragline was shipped from the old pit by truck. When the 350 stripper began uncovering the No. 6 in the new location, the dragline was pressed into coal-loading service. Small dump trucks were put in operation at that time and the first of the No. 6 coal went through the Atkinson plant Oct. 14, 1946.

The last of the No. 2 vein was loaded from the old pit Nov. 12, 1946, whereupon the 490 loading shovel was torn down. The lower frame, dipper and handle were shipped by truck and the upper frame by railroad. The old boom, which had seen 17 years of service, was scrapped and a new one installed. The job of dismantling, shipping and re-erecting this machine took a little over three weeks. Five men were employed one shift only and the dismantling and re-erecting time was about 17 days. Work was not continuous, however, as considerable repairing was done at the same time.

The 5480 shovel was next on the list and dismantling work began in November, 1946. The crew con-

sisted of 25 men on the first shift, 20 on the second and 12 on the third shift. Harry Spicher, a shovel operator at Farmington for many years and now assistant master mechanic at Mecco No. 1, joined the shop staff about that time and contributed greatly from his experience. Tearing down the 5480 machine was practically identical with that of dismantling the 350 unit. The parts were removed in the same order and shipped in the same manner. Dismantling and re-erecting time was about 70 working days.

During re-erection of the 5480 stripper, the same parts as on the 350 machine were replaced, plus a new boom foot casting and new socket casting. An extra ballast tank, with 50 tons of ballast, was added, while 20 tons of ballast was added to the 350 unit. The additional weight has provided better balance and permitted both machines to perform more efficiently.

### Rebuilt Shovels Perform Well

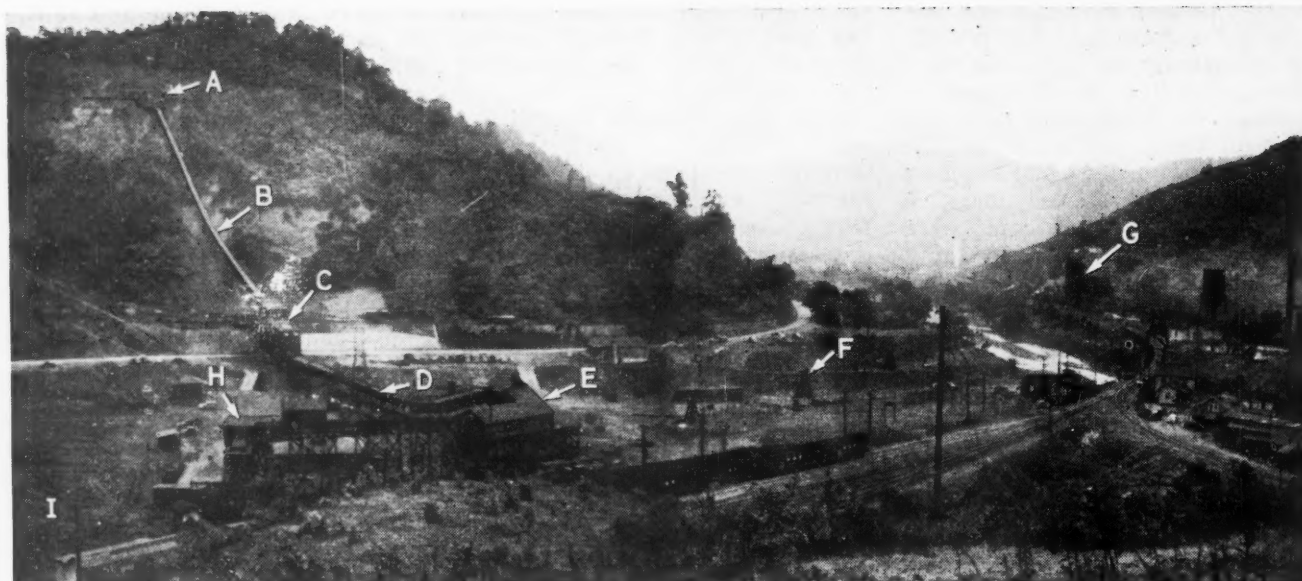
The 5480 machine began stripping in February, 1947. As a result of replacement and rehabilitation of parts the performance of both the 350 and 5480 machines compares favorably with that of new shovels.

During re-erection of the 5480, all parts and equipment for a new Marion 4121 knee-action loading shovel with  $7\frac{1}{2}$ -cu.yd. dipper arrived. Erection commenced as soon as the 5480 was out of the way. A few weeks later it was at work in the new pit and the older 490 shovel was temporarily placed on the inactive list.

Average thickness of the overburden at the Mineral pit is about 140 ft. Average coal thickness is 4 ft. 4 in. To date, daily output has averaged 2,200 tons. During the dismantling and erecting period a number of the other projects were completed. They included building of a new garage for the five 30-ton haulage units, consisting of Dart tractors and Austin-Western semi-trailers, similar to those employed at the company's Farmington and Repatee mines.

A new transfer hopper was erected near the pit on the spur line leading to the main line of the Rock Island. From the hopper a switch engine pulls the cars some 10 miles to the Atkinson preparation plant. Excellent coal quality and good pit conditions make the new Mineral operation a real addition to the list of Midland Electric properties.





POND CREEK COLLIERY—"A" is the headhouse at Thacker level; "B," rope-and-button conveyor; "C," picking-and-crushing tipple; "D," belt conveyor; "E," storage bin for aerial tram, "F," which delivers to the locomotive coaling station, "G," in Williamson. The loading chute for railroad cars is indicated by "H" and the coal-storage pile by "I."

# Pond Creek Productivity Upped

Long-Range Planning Eases Problem of Mining Four Coal Seams — Conveyor Production Increased by Widening Places and Eliminating Retreat Work in Rooms — Six-Mile 13,800-Volt Pole Line to Permit Central Metering, Cutting Power Cost — Other Mining Operations Modernized

By J. H. EDWARDS  
Associate Editor, Coal Age

A CHANGE in the working plan doubled production per man-shift on conveyor units at the Pond Creek colliery of the Norfolk & Western Ry. Co., Pike County, Ky., directly across Tug River from Williamson, W. Va. Long-range planning has been necessary in mining the four seams which lie one above the other in the same mountain. A new air shaft and fan have modernized ventilation and a new slope will simplify the handling of supplies in the seam at the lowest level, which is the largest pro-

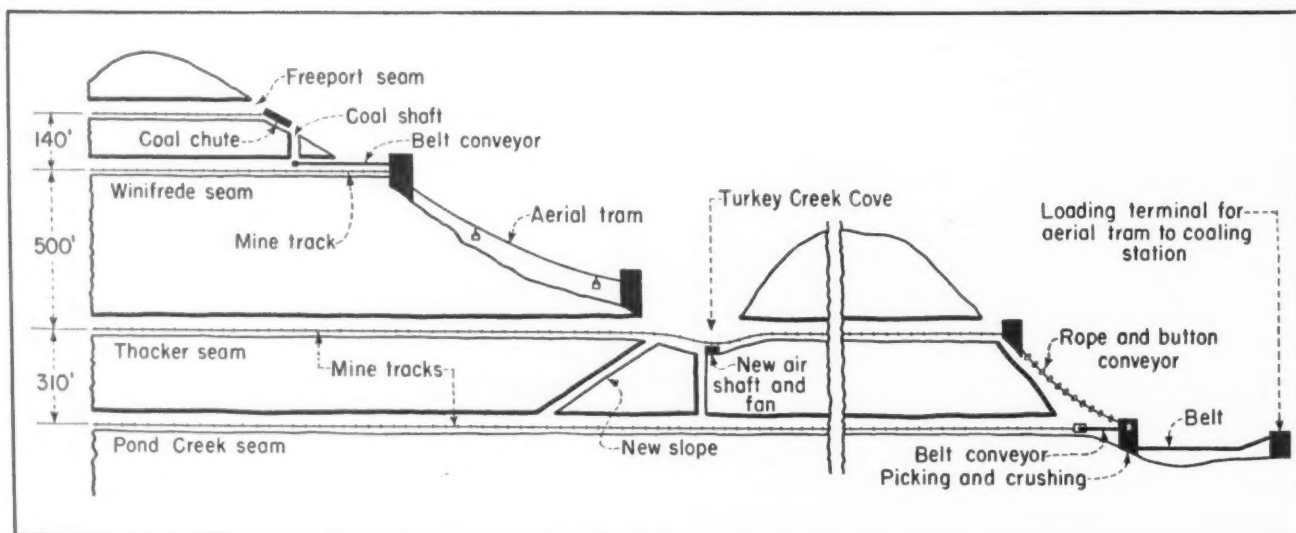
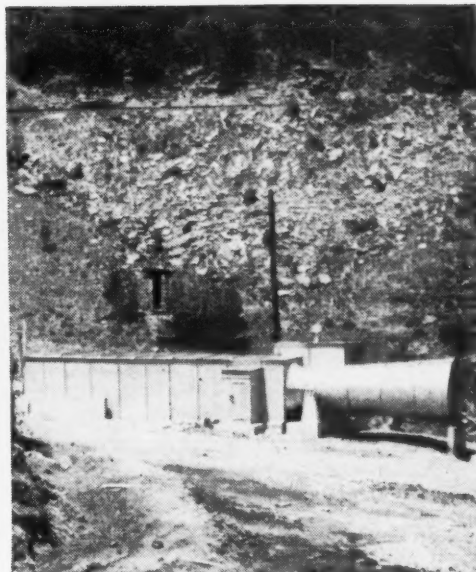


FIG. 1—SECTION through the mountain, showing schematically the four seams at Pond Creek colliery, their intervals and the coal-transportation facilities.



TURKEY CREEK COVE and the track over which Freeport and Winifrede coals are hauled through the Thacker seam. Two 5-ton gravity operated buckets lower the Freeport and Winifrede coals to this bin, 475 ft. below the Winifrede outcrop.



AT TURKEY CREEK COVE, a new shaft, 12 ft. in diameter, and a new 6-ft. 50,000-c.f.m. fan ventilate the Pond Creek workings 310 ft. below.

ducer. Central metering to reduce power cost for this colliery and also for the company's Howard colliery is another improvement now under way.

Of the four seams at Pond Creek colliery, the Pond Creek lies at tipple height (Fig. 1). Thickness ranges from 42 to 45 in., including 8 in. of laminated coal-and-bone a few inches from the top. Above a 6-in. to 2-ft. layer of drawslate, the top is a strong sandstone. The bottom is hard fire clay. This seam was opened in 1922 at Pond Creek Colliery and produced 4,570,600 tons to June 30, 1947. In May, 1947, the output was 32,605 tons. Three 12 BU Joy loaders are developing entries in the Pond Creek seam and

two Jeffrey chain-conveyor units are producing from rooms.

The Thacker seam, lying 310 ft. above the Pond Creek and averaging 40 in. in total thickness, usually is made up of 4 in. of coal in the bottom, above which are the following: slate, 1 in.; coal, 28 in. slate, 3 in.; coal, 4 in. The top is strong shale and the bottom hard fireclay. This seam was opened in 1920, before any of the others, and produced 4,890,690 tons to June 30, 1947. In May, 1947, output was 12,699 tons. From the Thacker level, the coal is lowered to the tipple by a 150-t.p.h. rope-and-button conveyor 600 ft. long.

Some 500 ft. above the Thacker is the Winifrede seam, ranging from

4 to 6 ft. in thickness, including, in most places, a 4- to 6-in. slate parting near the bottom. The top is a good sandstone and the bottom is hard. This seam was opened in 1944, produced 113,570 tons to June 30, 1947, and in May, 1947, turned out 11,867 tons. One Joy mobile loader is developing entries. The coal is lowered to Thacker-seam level by a gravity-operated aerial tram carrying two 5-ton buckets. From a bin at the bottom it is loaded into 3-ton mine cars for transportation through the Thacker seam to the rope-and-button conveyor previously mentioned.

At the mountain top, 140 ft. above the Winifrede, lies the Freeport seam averaging 70 in. in thick-

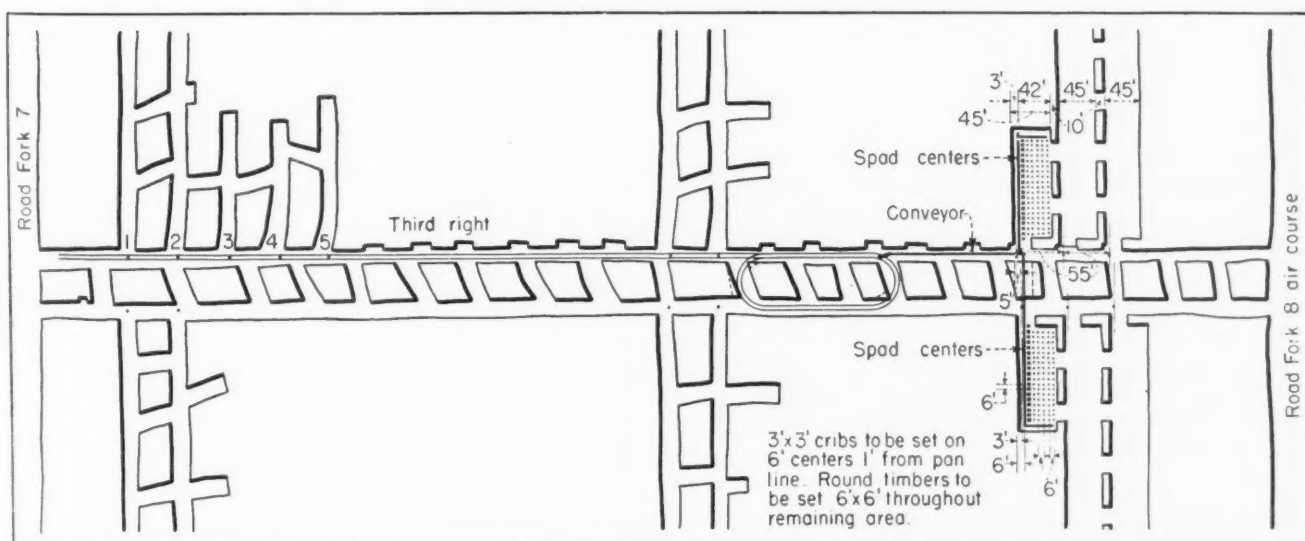


FIG. 2—THIS REVISED plan for conveyor work in territory developed for hand loading substantially increased tons per man over that secured with an earlier method using the same conveyors.

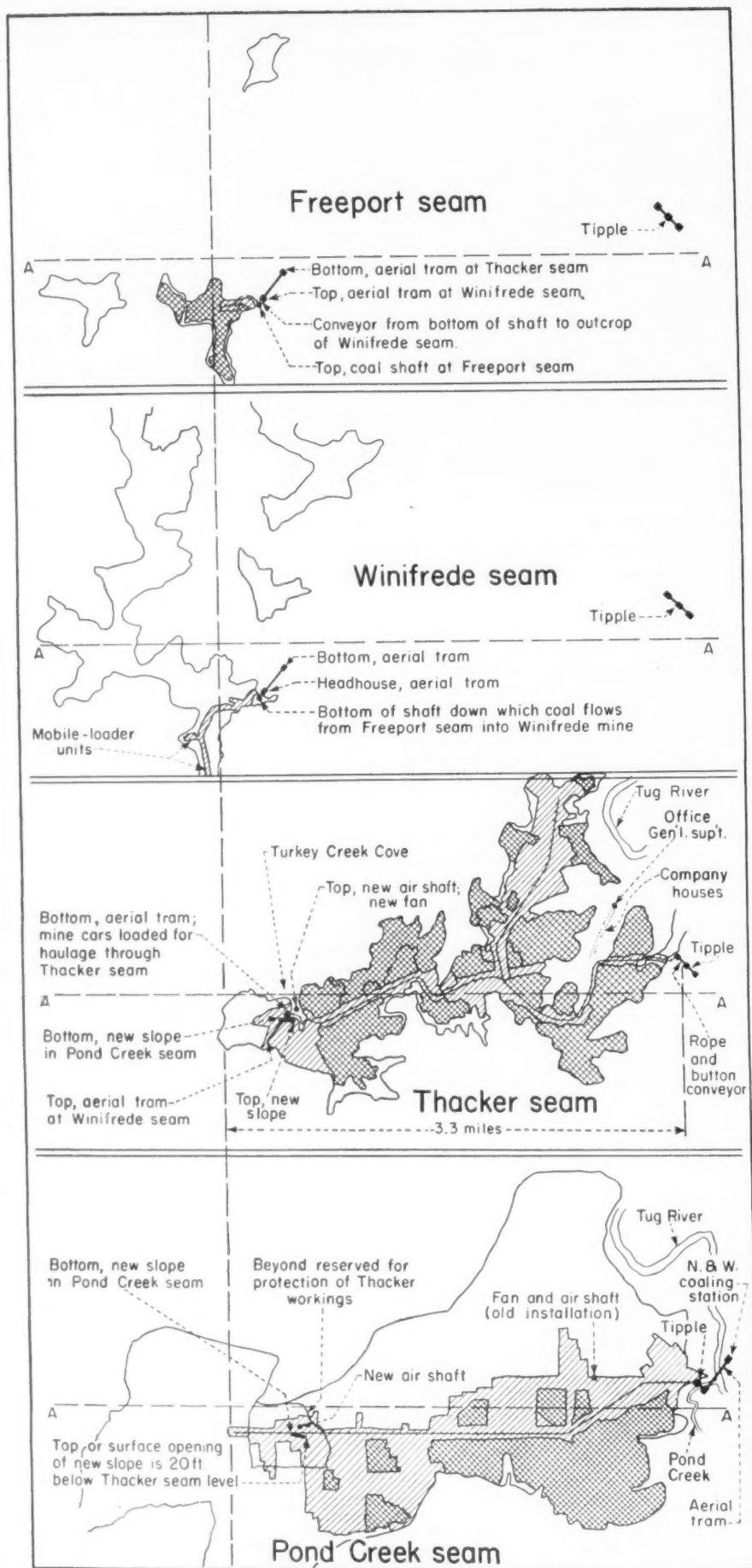


FIG. 3—MAPS of the outcrops, boundaries and workings of the four seams placed one above the other in true columnar relation. Single cross-hatching denotes areas developed, being developed or active. Double cross-hatching denotes areas already robbed.

ness with a good top and hard bottom. Mining was started in this seam in 1939. To June 30, 1947, 744,850 tons had been produced. Output in May, 1947, was 7,907 tons.

From a car dump at the Freeport outcrop, the coal from this seam slides down the mountain side 75 ft. through a chute and empties into a 8x8-ft. shaft, the bottom end of which is in the Winifrede mine. A belt conveyor 140 ft. long carries the coal from the shaft bottom to the Winifrede headhouse, where it mixes with the Winifrede coal and is carried down on the two-bucket aerial tram. The shaft serves also as a storage unit. Mining in the Freeport area has been pushed and will be finished within a year, thus leaving the way clear for mining the Winifrede acreage directly below, in which development is now going on.

#### Coal From All Seams Mixed

The coals from all four seams are mixed and the entire production of the colliery is used by the railroad as locomotive fuel. In the tipple at the foot of the rope-and-button conveyor, the minus-2-in. is screened out to bypass the picking tables and crusher and the remainder is separated into 3x5 egg and plus-5-in. for picking on two tables. Those two sizes are reassembled and crushed to 2 in. in a 30-in. Jeffrey single-roll crusher.

The bypassed and crushed products join and are moved 360 ft. on a 30-in. belt conveyor to a storage bin and aerial-tram loading station. The tram is a continuous unit with 1-ton buckets which carry the coal 1,650 ft., including crossing Tug River, to a locomotive coaling station in the N. & W. yards in Williamson. Capacity of the tram is 135 t.p.h., and about 800 tons per day is thus handled.

Colliery production in excess of the coaling-station requirement is loaded into railroad cars at a chute 180 ft. from the storage bin and tram-loading station. This conveying is done by a belt that also serves for storing coal. When ground storage is required, the coal either is loaded into railway cars for transportation to a distant storage point or is spilled onto the ground under the coal-loading chute and then pushed by a bulldozer to a nearby storage space. It is reclaimed by a locomotive crane with clamshell, assisted by the bulldozer.

Hand loading into mine cars was the production method in the Pond



Creek seam until 1945, when the two Jeffrey chain conveyors were installed. These are hand loaded and a panel unit consists of two face conveyors, two room conveyors, a mother conveyor and an elevating conveyor.

After a year of experimenting with room-and-pillar systems, operating a 30-ft. face, the method illustrated in Fig. 2 was adopted. In a short time, production per man-shift per face man was upped to 12 tons. The rooms are driven 45 ft. wide on 55-ft. centers and the 10-ft. room pillars are abandoned.

### Both Sides of Entry Worked

One room conveyor works on one side of the entry and the other on the opposite. Room-entry chain pillars are pierced by crosscuts 10 ft. wide to accommodate the room conveyor to the left, looking outby. These conveyors are being worked in territory which was developed into 280-ft. blocks by hand loading into mine cars when it was intended to mine the rooms the same way. Recovery with conveyors, even though the 10-ft. pillars are left, will compare favorably with that by hand loading, which has averaged approximately 85 percent in developed areas.

A spotting hoist is used at the loading point on the haulage loop, advancing the trip outby onto the haulage entry. When a locomotive heads in with another trip of empties, it continues to pull them while it pushes the loaded trip back past the loading point far enough so the new trip clears the switch, at which time the loaded trip is left standing and the new trip is backed the opposite direction around the loop, pushing the loads until the first empty is at the loading boom. The locomotive then uncouples, runs back around the loop, hooks to the loaded trip and pulls it straight out the haulage entry. Mine cars are solid-body units and the loading averages  $2\frac{1}{2}$  tons per car.

The life of a room is about half what it was with the room-and-pillar plan. In this shorter period, the drawslate seldom has time to loosen and give serious trouble. The four face men load just as many cuts per shift on the 45-ft. faces as they did on those 30 ft. long. There is much less tendency for them to get in each other's way. Twelve men comprise a unit crew. In addition to the eight face men, there is a supplyman for the two rooms, a timberman, also for two rooms, a boom man and a unit boss.

Undercutting is done with Jeffrey 35-L shortwalls making 7-ft. cuts. Minimum timbering in rooms consists of round timbers with 18-in. cap pieces set one row per cut 6 ft. apart. Hollow 3x3-ft. cribs, of square timbers, are set one crib per cut in a row next to the room conveyor. Cribs and posts are recovered where possible.

A loading machine, as previously noted, is used for development in the Winifrede seam. There is a Joy 8 BU unit, which places the coal directly into 3-ton mine cars. Each entry consists of three headings 18 ft. wide on 60-ft. centers. Eleven men comprise the crew and they produce 200 to 235 tons per shift.

The columnar relation of the coal areas of the four seams and the workings therein are indicated by the four maps comprising Fig. 3. The heavy broken lines (A-A) indicate common intersections. It will be noted that the Winifrede-seam development is directly under the practically-worked-out Freeport seam. When the Freeport is finished (within a year) the Winifrede will have ample development ready for production from rooms and pillars. On the Pond Creek map, a saw-toothed line indicates an active area in which no pillars are to be taken until the Thacker above has been finished.

On the Thacker seam map (Fig. 3), the cove at the head of Turkey Creek and the outcrop of the Thacker seam are indicated. It is here that the new air shaft and slope, both going down to the Pond Creek seam, have been completed. The shaft is 12 ft. in diameter, 310 ft. deep and is concrete-lined to a depth of 128 ft. from the surface.

A new 6-ft. Jeffrey Aerodyne fan exhausting 50,000 c.f.m. at a 2-in. watergauge is installed at the top of the shaft. Its drive is a General Electric 30-hp. 875-r.p.m. TriClad motor and the linestarter is a Westinghouse De-ion unit. Thermal relays (General Electric Type TB-9) installed on the fan bearings stop the motor in case of overheating. A siren blows when the motor stops for any reason. An operating test made on the fan by Jeffrey ventilation engineers during the evening of July 17, 1947, before officials of the coal company and a group of registered professional engineers of the Mingo chapter, showed 90 percent efficiency, assuming 88 percent motor efficiency and a 5-percent belt loss.

The new slope into the Pond Creek seam from Turkey Creek Cove is on a 31-deg. pitch. It is 645

ft. long and 6x16 ft. in section. Oak timbering was installed where necessary for a total distance of 160 ft. and the remainder, which is in rock, is without a lining. In addition to a 42-in.-gage supply track, the slope includes a concrete stairway 44 in. wide with steps  $11\frac{3}{4}$  in. wide with a 7-in. rise. An electric hoist has been installed to handle supplies through this slope to the underlying Pond Creek seam.

Three lamp houses serve the four seams. All the Pond Creek miners and some of the Thacker men get their lamps near the main tippie. Most of the Thacker men are served from a lamp house at the head of a hollow where the company houses are located (Fig. 3). To serve the Freeport and Winifrede miners, a lamp house is maintained at the Winifrede level in Turkey Creek Cove.

### Central Metering Planned

Across Tug River in West Virginia and six miles air line from the Pond Creek tippie is the Howard colliery tippie over which coals from three other mines of the N. & W. are handled. To gain the advantage of central metering in purchasing electric power, the coal company is building a six-mile wood-pole transmission line (three No. 2 copper conductors) to transmit 13,800 volts from an a.c. substation near the Pond Creek tippie to the Howard colliery, where it will be reduced for mine use. At that substation, the coal company is installing three 833-kva. transformers to receive 46,000-volt power and deliver three voltages; 13,800, 4,150 and 2,300. The 4,150-volt power will serve Pond Creek Colliery and the 2,300-volt power will go to the N. & W. yards in Williamson. All the mines use 275-volt d.c. power underground and the substations employ motor-generator sets and converters.

From 1917 to 1937, the planning and operations of the N. & W. Ry. mines was under the direction of Geo. Dunglinson Jr., manager of the Fuel Department. Since 1937, the management has been directed by the general superintendent of the Western General Division of the N. & W. lines, which position is now held by O. M. Dawson. For the Pond Creek colliery, O. W. Evans is general superintendent, having held this position since Jan. 1, 1926. E. S. Hamilton is superintendent, Stephen C. Younger is safety engineer, G. W. Timberman is chief engineer and Joseph V. Moncho is general mine foreman.



HIGH-PRESSURE SPRAYS at the rotary dump now suppress the dust as coal is transferred from 7-ton cars to 7-ton skips. Use of a wetting agent reduces the water needed by about one-fourth and avoids caking the inner surfaces of the mine cars.

## High-Pressure Sprays Trap Dust

Health and Visibility Aided by 14 Flat and Solid-Cone-Type Sprays on Underground Rotary Dump at Old Ben's New No. 9 Mine—Addition of Wetting Agent Conserves Water—Caking of Inner Surfaces of Mine Cars Prevented

HIGH-PRESSURE SPRAYS trap the dust as the coal is transferred from the 7-ton mine cars to 7-ton skips at the underground rotary-dump station at Old Ben Coal Corp.'s new No. 9 mine at West Frankfort, Franklin County, Ill. Water, with a wetting agent added,

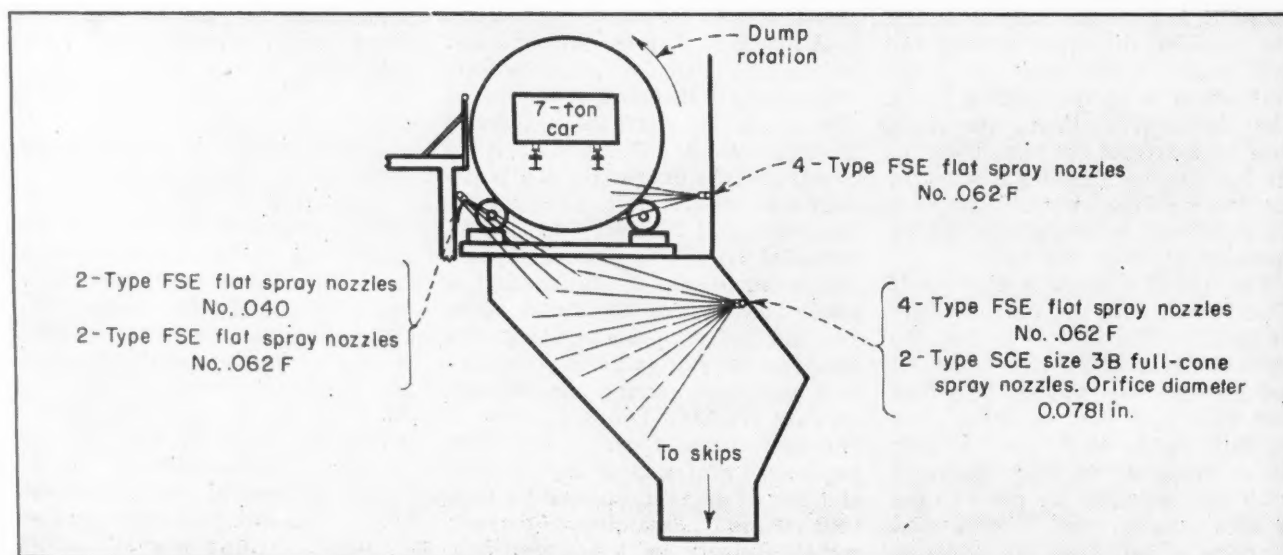
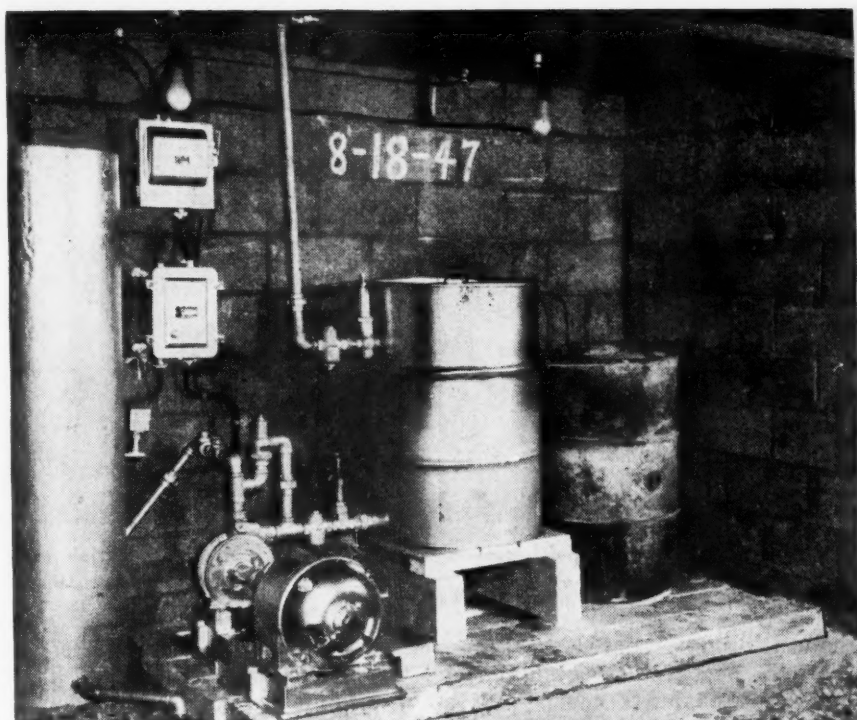


FIG. 1—HOW THE THREE GROUPS of sprays, totaling 14 nozzles, are placed at the rotary-dump station. In a pressure range of 75 to 100 lb. the spray is effective up to a distance of 7 ft. The sprays operate for about 5 sec. for each 360-deg. rotation of the dump and with a capacity of 11 g.p.m. use only about 1 gal. of treated water for each dumping.





THE UNIT for mixing the solution. Placing the proportioning tank on a 12-in.-high platform raises the eductor above the chemical barrel and prevents siphoning.



COVER of the proportioning unit is raised by Nick Kovaleski, mine electrician.

allays the dust, resulting in a healthier and safer working atmosphere. Compound M-treated water permits using only one-fourth the quantity of water usually required to trap the dust and eliminates the risks of caking the inner surfaces of the mine cars with wet dust or upsetting the preparation of the coal in the tipple.

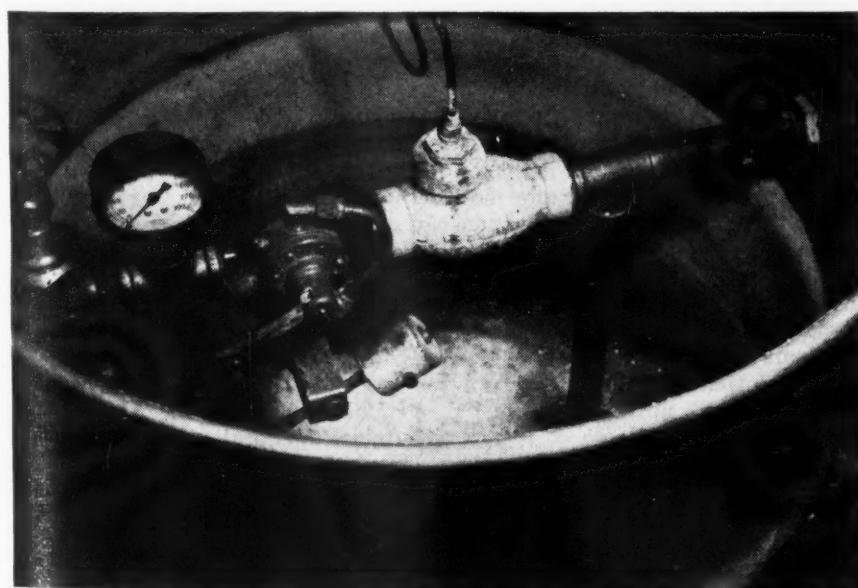
Cutting, loading and dumping of coal underground can bring the concentration of dust in a mine to over

500 million particles per cubic foot of air. Liberal water spraying requires tremendous quantities of water, which increases costs and runs up the tare weight of mine cars through the caking of the inner surfaces with wet dust. And, in some instances, the excess moisture proves bothersome in the final preparation of the coal. However, by adding Compound M—a synthetic wetting agent developed by the Johnson-March Corp.—to the water

for the spray, in the ratio of 1 to 1,000, the dust can be reduced below the safe limit of 50 million particles per cubic foot of air with a fraction of the water.

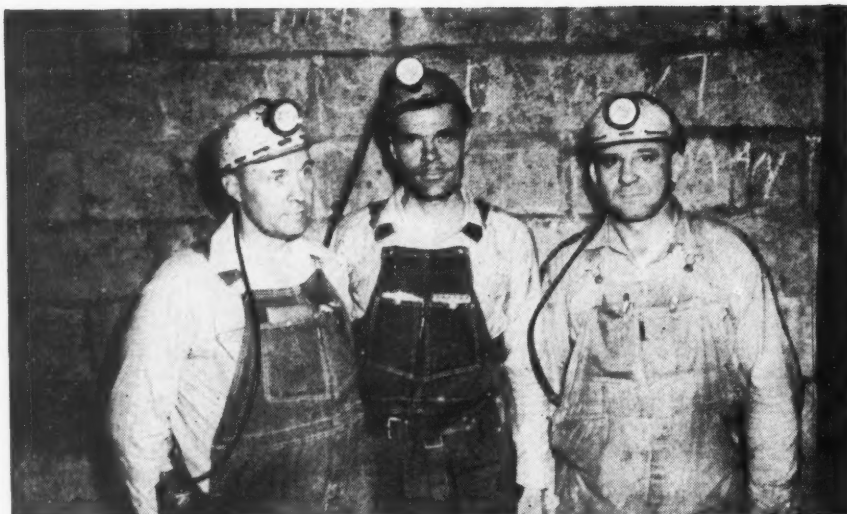
#### Fourteen Nozzles Used

Old Ben's rotary-dump solid-cone-type spray installation, supplied by The Coal Treating Equipment Corp. of New York, uses three groups, or a total of 14 nozzles, to trap the dust as the 7-ton car makes a complete revolution in the dump. Two Type FSE No. .040 and two Type FSE No. .062F flat spray nozzles (Fig. 1) are directed downward at an angle of 45 deg. in the direction the dump rotates and trap any dust that tries to escape from the left side of the dump. Four Type FSE No. .062F and two Type SCE-3B-.0781 full-cone spray nozzles are mounted on the opposite side of the dump along the wall of the chute pocket and are directed horizontally. Four Type FSE No. .062F flat spray nozzles, with an orifice diameter of 0.062 in., are mounted on the same side of the dump as the chute pocket sprays but up where the sprays are effective in trapping the dust fanned by the car in the last 180 deg. of its travel. This group of sprays also catches the dust held in the vacuum caused by the coal leaving the car. This prevents any dust from floating lazily away after the car has



PRINCIPAL PARTS of the proportioning unit are: globe valve (left), pressure gage and float valve on the incoming water line; and filter, needle valve with connection to chemical suction line and eductor. A turbine pump draws the solution from this barrel.





SUPERVISORS interested in operation of the sprays are: Frank Eubanks (left), superintendent of maintenance; John Sharkey, mine manager; and Nick Kovaleski, electrician.



JIM SWALLS, cager, likes his job better since the sprays have been installed.

been uprighied and is ready to be moved from the dump.

In the pressure range of 75 to 100 lb. the spray from these nozzles is effective up to a distance of 7 ft. The capacity of the 14 sprays is approximately 11 g.p.m. at a mean pressure of 90 lb. However, for each rotation of the dump the sprays are on only about 5 sec. and, therefore, use only 1 gal. of the Compound M-treated water. The size 2B nozzle has a 70-deg.-range angle and the 3B a 50-deg. angle.

#### Flat Vs. Cone Spray

Flat or sheet spray, and also the narrow-angle solid-cone spray nozzles are available for dust suppression. The flat or sheet spray type emits a cutting liquid stream in finely divided particles, spread out at a fairly wide angle with little thickness. This type has been applied on belts and loading machines. Where all of the dust can be trapped below the liquid stream, this type of nozzle is satisfactory.

The narrow-angle solid-cone-type sprays are particularly suitable for cutting machines. They discharge greater distances and more effectively than the wide angle solid-cone sprays of the same capacity. Since it is difficult to remove dust from the air once it is in suspension, it is therefore desirable to "kill" the dust at its source. Concentration of the spray pattern at a considerable distance, for example, an 18-in.-diameter pattern at 10 ft., helps to accomplish this by "killing" the dust before it gets very far. In undercutting work the impact between the spray particles and the dust meeting headon at considerable velocities accelerates

the wetting process at the coal face.

At the new No. 9 the equipment back of the sprays consists of a water supply (which must have as much as 30 lb. pressure for the Type E chemical-proportioning unit), a proportioning unit for mixing the Compound M at a ratio of 1 to 1,000 parts of water, a storage barrel, and a turbine pump with pressure tank and controls. Water for this equipment comes from the West Frankfort city system and enters the mine through a 4-in. pipe, used occasionally as a pump discharge line when the shaft sump has to be emptied.

#### Float Valve Controls Mixing

As long as the globe valve on the water line is open the operation of the proportioning unit is subject to the control of the float valve. The float valve automatically controls the water flow and is directly connected with the eductor, pumping and mixing the chemical with the water. The chemical is shut off automatically when the water flow ceases. A filter with 0.0035-in. openings is located in the chemical suction line and a heavy screen strainer in the water line helps prevent foreign matter from clogging the proportioning unit. The newly mixed spray solution remains in the proportioning tank until drawn out by the pressure pump.

A Size 15T Apco turbine pump, driven by a General Electric Tri-Clad motor, is used to apply pressure to the spray solution. The turbine-type pump is reported to be particularly suited for high-pressure tank jobs, since it is capable of developing pressures up to 175 lb. per square inch with a single

stage. Plunger pumps may be used where a constant supply of liquid at medium or high pressure is available for feeding such a pump. Using a plunger-type pump to pump from a tank is a little risky. The tank may become empty and the pump packing be damaged by scoring, due to friction. Single-stage centrifugal pumps are volume pumps and are generally assigned to high-volume low-pressure work.

#### Tank Saves Pump Operation

A pressure tank, fabricated on the job from a 5-ft. section of 18-in. double-strength pipe, helps reduce the heating of the turbine pump by permitting it to run intermittently. Now, in place of the pump operating continuously, it operates once every 2½ revolutions of the dump. The pump cuts-in when the pressure falls to 80 lb. and cuts-out when the pressure reaches 100.

Officials of the Old Ben Coal Corp., with headquarters at 230 S. Clark St., Chicago, are: D. W. Buchanan, president, and George F. Campbell, vice president in charge of operations. In the operating office at West Frankfort are: R. L. Adams, general superintendent; E. E. Green, assistant general superintendent; Howard Lewis, underground superintendent; Ed R. Lutz, outside general superintendent; Frank Eubanks, superintendent of maintenance; John E. Jones, safety engineer; J. W. MacDonald, chief engineer; and Hollis Pierce and George A. Strunk, electrical engineers. In the operating department at the new No. 9 are: John Sharkey, mine manager; and Nick Kovaleski, mine electrician.



# The Marshall Program

WHAT WILL THE MARSHALL PROGRAM mean to American business? What industries will be called upon to meet the needs, and how great are they likely to be? Will the program carry with it another dose of inflation? Are new bottlenecks being created, or will old ones gain a new lease on life? Where are material shortages likely to fall most heavily?

These and a hundred other questions are in the minds of many American businessmen today. Unfortunately, no final or precise answer can be given to some of them. And it is in the nature of the problem which the Marshall program tackles — that of getting Western Europe on a steady economic foundation — that no precise answers are going to be possible. We have only to view the bad breaks Europe has collected since V-J Day, including the blizzards and drought of this past year, to see how the economic picture can change on short notice.

Nonetheless, the broad dimensions of a Marshall program are sufficiently clear to permit more than a guess about its impact on American business. Both here and abroad committees have been busy

for months shaping up Western Europe's rehabilitation needs. At the same time a mine of information has been pulled together about our own output and capacity. The result is a small library of technical reports which carry most of the facts Congress needs for a decision on the immediate problem.

McGraw-Hill's Department of Economics has waded through these reports and queried industry itself to determine the likely effect of the Marshall program on American business. This report carries the main results of their investigation.

One conclusion emerges clear-cut. American business can not provide the assistance Western Europe will need without considerable cost to itself. Such costs are outweighed by the gains that can be expected, economic and social, as well as political. Nevertheless, business will want to anticipate those difficulties that might arise and move to overcome them. The following pages, therefore, highlight both the problems and the benefits that are likely to fall to American business as a result of the Marshall program.



# The Marshall Program

## WHAT IT MEANS TO AMERICAN BUSINESS

WESTERN EUROPE'S INDUSTRIAL MACHINE has picked up considerable speed since V-J Day. But vital gears are not meshing and industry isn't getting the job done that is necessary. The things people most need are those that are lacking. Food output is down more than a fourth. Coal production is lower by a fifth. The net result is a living standard that ranges from bare subsistence in some countries to a level far short of prewar in others. And even this depends on imports for which the area can't pay.

This melancholy economic picture has its political counterpart. The best organized and the most energetic political party in France and Italy is Communist. While the Communists in Germany and Austria are less strong, they still are an element to be reckoned with. These are all key areas which, should they fall within the orbit of an unfriendly power, could well destroy the freedom of political action throughout all of Western Europe.

Needless to say, such a development would have military implications of the utmost importance. It is a military axiom that any defense must be organized in depth. And in the event of any emergency "depth" for the United States must now include Western Europe.

It is this complex mixture of the economic, political, and military, then, that has led to the Marshall program. Underlying this program is a deep conviction: That Western Europe possesses the skills and resources necessary to work out its own economic salvation. The fact that in two years it has not done so reflects both the depth of the wounds it suffered in war and the bad breaks it has received since then. With time these skills and resources can reassert themselves. Meanwhile, food, equipment, and materials from America will shorten the job and enable Western Europe to stay on its feet.

### Western Europe's Program

SECRETARY MARSHALL gave the program that bears his name its initial push. But it is Western Europe which quickly seized the initiative. A committee of 16 nations met and surveyed their needs and resources. From this survey grew a broad program designed to achieve a balance between the economies of Western Europe and the rest of the world by 1952. Moreover, the program seeks such a balance while raising the standard of living close to that of pre-war days. Hunger and disorder which force extreme social change might thus be eliminated.

As developed thus far Western Europe's economic program is not a detailed plan of action. It does, however, lay out the terrain that must be covered if its objectives are to be reached. Four fields are staked out for action. One involves an immense effort on the part of the cooperating nations to raise their own capacity and

output. A second requires the establishment of internal financial stability in countries like France and Italy that now lack it. A third looks forward to closer economic cooperation between the participating countries on a more permanent basis. Finally, a fourth lays out the extent and nature of the aid which Western Europe will require from the United States and the rest of the Western Hemisphere.

It is this fourth aspect of Western Europe's program that is of primary concern to us here. Nevertheless, the hard core of the Marshall Plan is that aid alone can not solve Europe's problem. And it is no exaggeration to say that the most important features of any program are those which Europe itself must fulfill. In this regard, nothing is more critical than the goals set for an expanded capacity and production.

### THE PRODUCTION GOALS

Europe's production goals also have an importance for American business. They suggest lines in which Europe eventually will become independent of the United States, as well as competitive in world markets. Here are some of their highlights:

- a) An increase of steel ingot production to 61 million tons, a fifth higher than 1938.
- b) Development of oil refining capacity to 2½ times pre-war (largely for refining imported crude).
- c) Increase of coal output to 644 million tons (U.S. output in 1947 is around 600 million tons).
- d) Rapid advance in the output of electrical products—needed in part to help equip a 25 million kw expansion of generating capacity.
- e) A large increase in capacity of other key equipment industries; e.g., mine equipment, petroleum equipment, farm machinery, construction equipment.
- f) Restoration of pre-war output of bread grains and cereals; expansion in sugar, potatoes, fats and oils.
- g) Restoration of merchant fleets to pre-war size.

These are very ambitious goals. They call for a great advance from the current position, as the chart on the next text page shows. In some aspects (electricity, food-stuffs, perhaps coal, are examples) they appear unlikely to be met, at least by 1952. Such a development would, of course, modify the import list.

### THE IMPORT REQUIREMENTS

To do the job that confronts it Western Europe has said it needs more than \$20.5 billion of goods and services from this country over a period of four years. In return it would plan to offer us goods and services to the value of \$4.7 billion. That leaves a whopping deficit of about \$16 billion. The heaviest commodity export (\$4 billion)—and the biggest chunk of the deficit—would arise next year. Thereafter, exports would fall off about

(Continued on page after next)



# Coal: KEY TO RECOVERY

COAL IS AT THE HEART of what is wrong with European industry today. Because of the lack of coal, factories run part time, fields are less fertile, and firesides are cold.

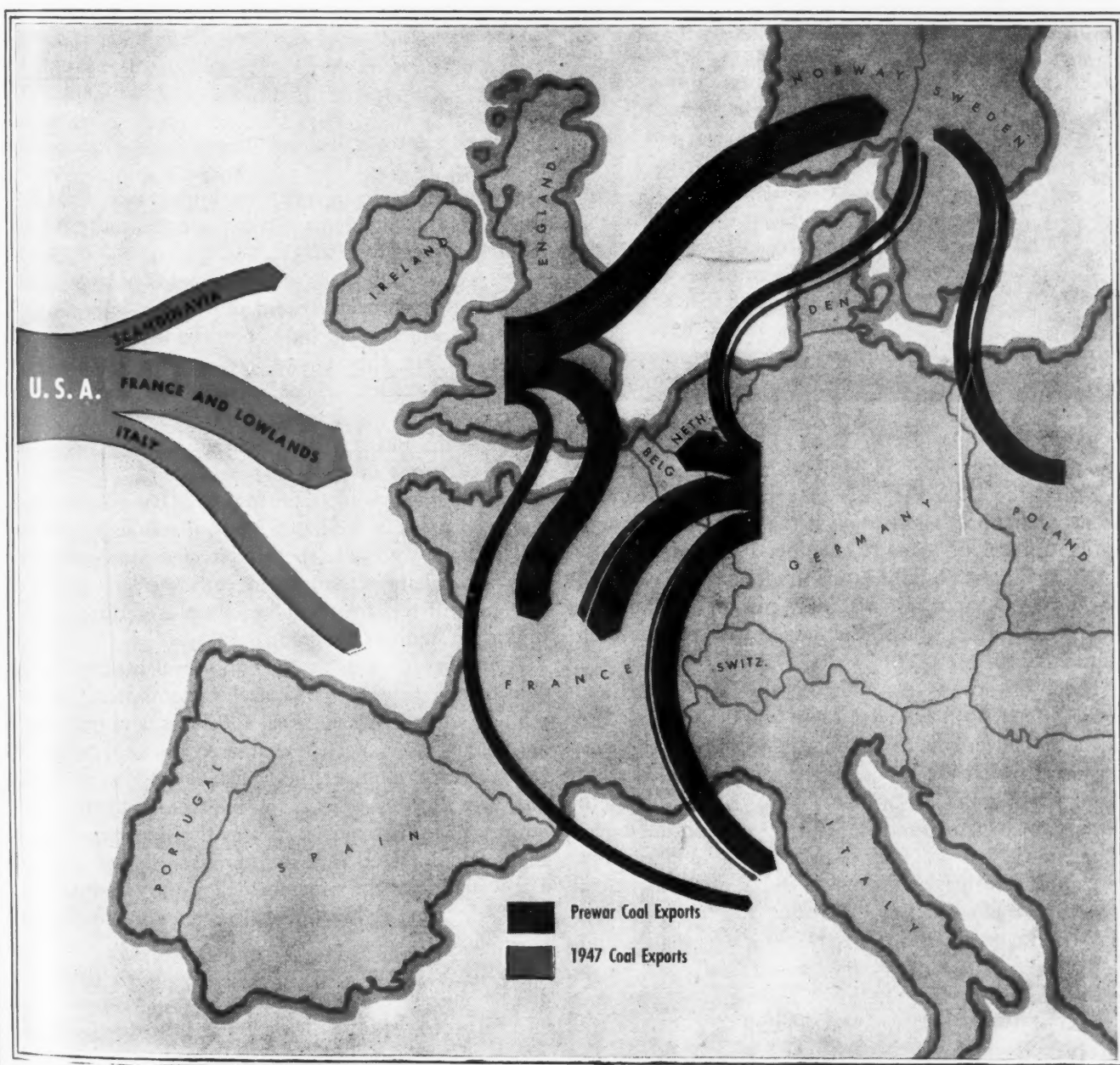
What Western Europe plans to do about coal is typical of what it plans to do about industry generally. The job is to expand output in its own producing centers, resume exports within the region, and cut down costly and unnecessary imports from the United States.

In the case of coal this means restoring a flow which in pre-war days was the life-blood of Europe's industry. As the map shows, two great coal centers — Britain and Germany — supplied not only their own nationals but the needs of other countries as well. Today Britain can't meet its own requirements and coal production in the

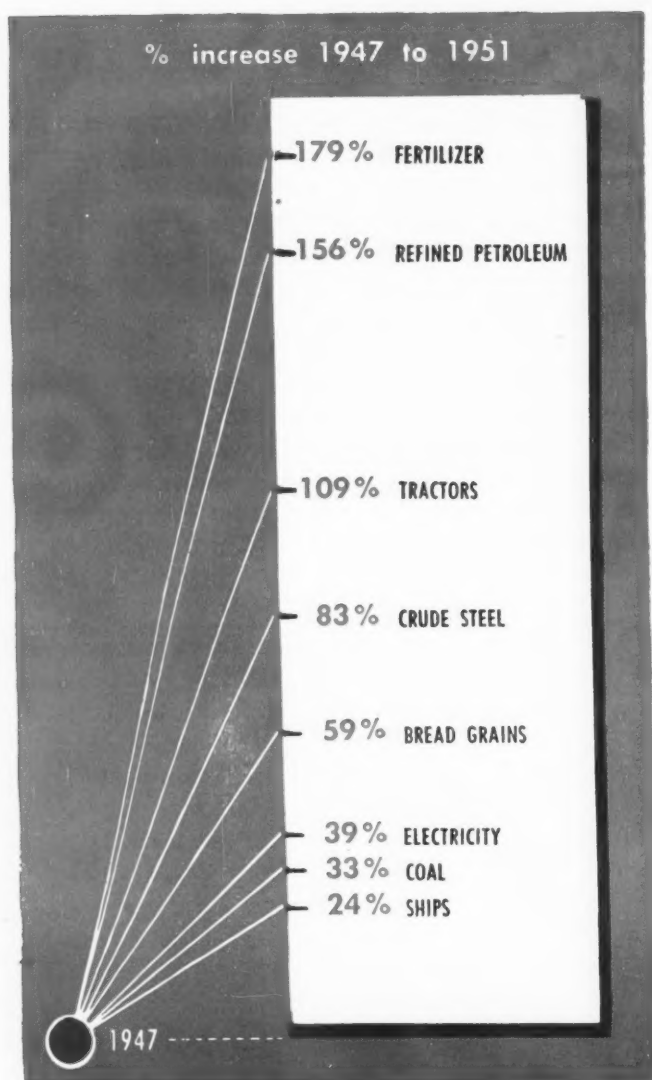
Ruhr is but half of what it was. The result is the costly necessity to haul coal from the United States.

Western Europe will need 45.2 million short tons of U.S. coal next year. Meanwhile, it plans to build up its own production. By 1951 it hopes to turn out coal at more than the pre-war rate, with Britain and the Ruhr sending sizeable shipments to their neighbors. Coal from the U.S. will have been cut to 6.6 million tons.

Two developments are vital. First, Western Europe must reequip its mines. This calls for a vast production effort on its own part, as well as the import of specialized equipment from the U.S. Second, a river of coal, 34.2 million tons in 1951, must breach the iron curtain and flow from Poland to the West.



## Western Europe's Production Goals



one-third to a total of \$4.1 billion in 1951.

Nor is the U.S. the only base from which Europe needs vital supplies for which it can't pay. Canada and Latin America are asked to shoulder a trade deficit that comes to almost \$6 billions for the four years. Needless to say, if food and raw materials are not available on credit from these areas, the larger will be the sum required from the U.S.

There already is considerable debate about these figures. There will be a lot more while Congress considers the aid program. The fact is, and this is the conclusion at which the President's Committee on Foreign Aid arrived, no final estimate of how much Western Europe's needs might cost over four years can be made. Crops, industrial production, prices, trade relationships and a host of other factors may turn out differently than anyone now expects. For this reason the United States may choose to review Western Europe's progress and its import needs on a yearly basis, rather than fix in detail a four year program. For the same reason our discussion of Western Europe's requirements concentrates largely on the picture in 1948.

As it now stands, the list of items that Europe wants to get from us is more general than specific. Moreover, inter-departmental committees have taken the list and pared it down, chiefly on grounds the supplies are not available. Here is the way the general categories shape up, both as initially requested and as revised. The figures represent total imports and are in millions of dollars.

	European Committee Estimate for 1948	Estimate for 1948 as revised	European Committee Estimate 1948-52
Food, Feed, and Fertilizer....	1,500	1,270	5,400
Cotton .....	400	350	2,000
Coal .....	340	370	700
Iron and Steel Products.....	370	230	1,200
Petroleum Products .....	510	485	2,200
Chemicals .....	250	200	850
Timber .....	100	95	400
Farm Machinery .....	370	100	1,100
Inland Transport Equipment..	200	60	490
Petroleum Equipment .....	170	130	555
Mining Machinery .....	80	80	220
Electrical Equipment .....	150	125	500
Machine Tools and other Machinery .....	545	450	1,750
Miscellaneous .....	1,065	1,065	3,030
	6,050	5,010	20,395

A quick glance behind these totals reveals the following:

Among agricultural supplies breadgrains and feedstuffs are the big items. Dairy products and fats and oils are also sizeable.

Of the \$2 billion or more of petroleum products, three-fourths are refined and one-fourth is crude.

Coal shipments will bulk large the first year (45 million tons) but they fall off rapidly thereafter.

The steel request originally included 1.5 million tons of scrap in 1948 and more thereafter. This isn't available. Of the finished items, sheet and tin plate come to 744,000 tons in 1948, the peak year.

The chemicals wanted are industrial chemicals, paints, and medicinals as well as a lot of unnamed specialties.

The huge catch-all labeled miscellaneous covers textiles and whatever additional consumer manufactures Europe will seek. Aircraft and surplus ships are other important items in the group.

A number of items on the equipment list could cause considerable trouble. Farm machinery, mine equipment, refining equipment, electrical apparatus, and freight cars are among these. Each is examined in detail below.

These exports under the Marshall program, if carried out, will affect all of U.S. business down to the corner grocery store. In many instances the impact will be so slight and indirect as to be hardly noticeable. But in a few industries the program will loom as a major element, dictating production patterns and setting a limit to capital expansion plans.

It's hard to paint a simple picture of a situation so diverse as this. We try to do so below by dividing the effects of the Marshall program into several broad groups. First we consider the impact of the program on



the general level of business. Next, we cover the impact on leading industries — steel, oil, electrical equipment, farm machinery, and the like — and the effect on business through the creation of shortages in these items. Finally, we examine the influence of the program on farm prices and living costs.

### THE OVER-ALL LOOK

The Marshall program comes at a time when certain demands contributing great inflationary pressure on business are beginning to slacken. While it will help hold business at a high level, the program itself is not great enough to maintain a general inflationary pressure. Nevertheless, it will give new strength to shortages that have been troublesome to business. In these latter areas, as well as on the food front, prices will continue firm and may go even higher.

If the program is carried out along lines described above exports to Europe will run about \$5 billion. The gain here will offset a decline that has already begun in U.S. exports to other areas. After a careful study of these divergent trends, we conclude the end result is likely to be a total export of goods at a rate of about \$15 billion in 1948. However, this rate will only be reached after the program starts rolling. The sale of services — shipping, tourist and the like — will add another \$2.5 billion to our foreign account. Moreover, this over-all sum of \$17.5 billion probably will run about \$9 or \$10 billion greater than our imports.

Under the Marshall program, then, our foreign trade in 1948 will be carried toward the peak that prevailed in second-quarter 1947. But the over-all inflationary impact of exports in 1948 is bound to be less than it was in second quarter 1947. Not only is our capacity to produce growing, but certain elements in our domestic demand are almost certain to be less strong next year.

This last fact is important and needs to be spelled out. Indeed, it's impossible to determine the effects of the Marshall program without some idea of what would happen to business without it. The accompanying chart which shows how our gross product has been split up in the past several years serves as the starting point for such an estimate. There it can be seen that the spending of domestic consumers takes the biggest slice of the gross product (\$164 billion). However, the share going to business and to government also has been sizeable (about \$30 billion each). Alongside each of these the net expenditure of foreigners on our goods seems small. Nevertheless, it has a tremendous importance to a huge number of business firms and industries.

Left by themselves, the spending of consumers and of government would be likely to fall very little if at all next year. But business outlays — spending on plant, equipment, inventories, and residential housing — are another matter. Here the vulnerable items are plant and equipment. Capital expansion has been extraordinarily large for two years, and in not a few cases business is completing its initial post-war program of capacity expansion. Therefore, some decline, but not a large one,

is expected in the aggregate of business spending during 1948. This in turn would have some reaction — but again a minor one — on the spending of consumers.

The net effect of such developments should be to place industry in a better position to meet the pressing needs of the Marshall program. This does not mean, however, that the program can be handled without difficulty. The trouble is that many of the items Western Europe most needs are those which would, under normal conditions, continue in tight supply. It is these bottlenecks that business will want to anticipate and, to the extent possible, overcome. Here are the facts concerning the most important of them.

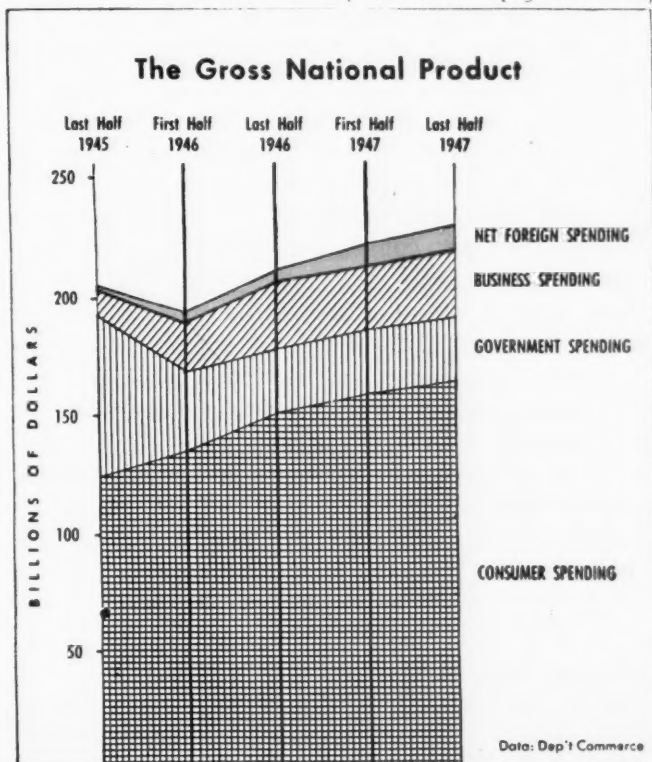
### COAL: TRANSPORT IS THE DIFFICULTY

Western Europe wants 45 million tons of coal from the U. S. in 1948. Thereafter requirements drop sharply to 6½ million tons in 1951.

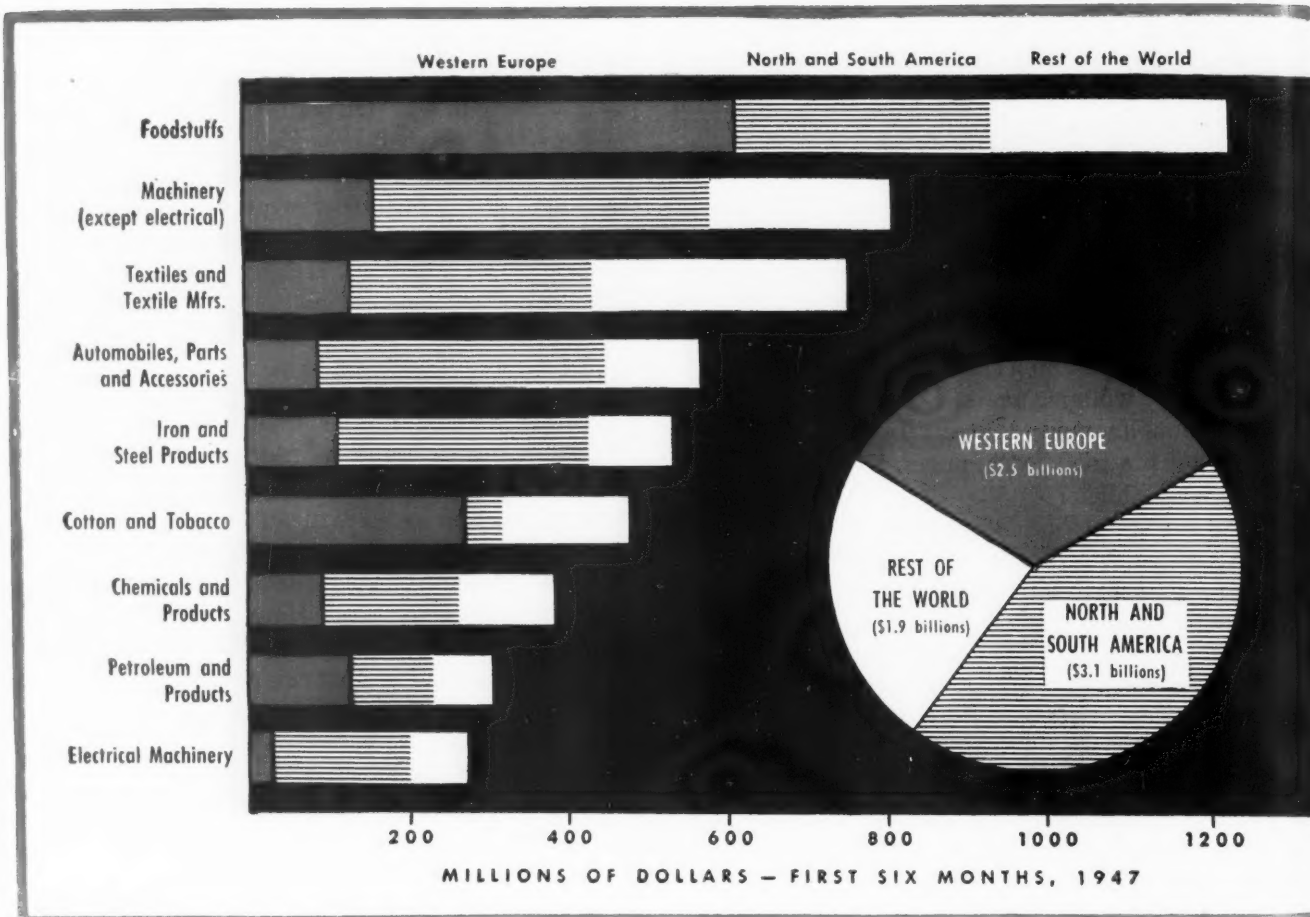
U.S. production of bituminous next year ought to equal the 600 million tons turned out in 1947. If it does we can meet Europe's need. However, the job will call for careful scheduling of delivery. For the real problem in coal is a shortage of coal cars. This has plagued industrial consumers in 1947. Unless car turn-around times are improved (they now average 14 days as against 11 during the war) car shortages will continue through 1948. Under such circumstances, exports to Europe won't permit the accumulation of normal stockpiles — a fact managements in many industries won't like.

Any actual shortage in production that might develop will be limited to special types of coal — particularly the better grades of coking and by-product coal. Europe has concentrated largely on these. Such concentration isn't necessary, but since transport costs (the big element for Europe) are about the same for all grades, Europe has

(Continued on page after next)







## U. S. EXPORTS . . . Where they go — What they are

U. S. EXPORTS THIS YEAR hit an all time high. Shipments in the first six months were at an annual rate of \$15 billion, four times the pre-war rate. Since then they have declined, but not greatly. The export rate now is about \$13 billion.

Foodstuffs have moved to the top of the export list. The needs of Europe combined with crop failure in Southeast Asia have revived an export that before the war seemed all but dead. About half this record flow has been directed to countries included in the Marshall program.

Next on the list are the durable goods that have come to symbolize the strength of American industry. Machinery, automobiles, and steel products are all in extraordinary demand abroad. In spite of domestic shortages, shipments have been relatively heavy. Thus in one form or another about 18% of our tight steel supply has moved abroad this year. Canada and Latin America have been the big customers, and sizeable quantities of machinery have also gone to Russia. Other than France (which had a big loan for the purpose) Western Europe has not been in the market. They've needed the goods but lacked the dollars.

Textiles have been another huge export group. Here the influx of new foreign customers has been warmly welcomed. For heavy buying from abroad has kept tex-

tile output going at a good pace.

Cotton, tobacco, oil, and chemicals are other supplies that bulk large in U.S. trade. Western Europe has been a principal buyer of all except chemicals. Canada and Latin America again have been at the head of the line for these last items.

Regardless of the Marshall Program, some shift in U.S. export trade could be expected in 1948. The recent splurge of foreign buying cannot be maintained if for no other reason than that funds will not be available. U.S. import of goods and services — the chief source of dollars for most of the world — has been only 40% of exports. About \$10 billion of loans and relief grants helped keep Europe in the market. At the same time, foreign nations drew down dollar balances and shipped gold.

Net effect of the Marshall program on exports is to provide \$4 to \$5 billion of trade that otherwise is lacking. Not all this added trade need be with Europe. If the U.S. provides dollars for Western Europe to buy in Latin America and Canada—which it well might—those areas will spend more here. Nevertheless, under the Marshall program much more of our trade will be directed toward Western Europe and the things it wants. These are foodstuffs, industrial supplies, and machinery. Little in the way of textiles or automotive equipment is on Western Europe's shopping list.

sought the best. U. S. utilities, steel and gas manufacturers, and the Great Lakes trade are large domestic users of these fuels. They will continue to feel competitive pressure unless Europe's buying habits are changed.

## PETROLEUM — WORLD-WIDE SHORTAGE

Regardless of whether the U. S. provides the full amount of petroleum Western Europe has asked for, industry and households may have to go slower on switching to fuel oil than they desire. Oil already is in tight supply in America, and this reflects a shortage that is world wide. The cause of this shortage lies not only in refining and production bottlenecks. Perhaps even more important is the lack of sufficient transport capacity, particularly pipe-line and tank car. With steel (including pipe and tubes) as it is and will be, this tight oil situation can't take a quick turn for the better.

Europe wants to build up its imports of crude and do a steadily larger amount of processing on its home grounds. Here is the way dollar imports of the two broad groups were initially scheduled by the European Committee at Paris (figures are millions of tons).

	Imports of Crude	Imports of Refined Products
1947.....	6.1	17.0
1948.....	8.5	17.7
1949.....	10.2	19.0
1950.....	12.6	18.2
1951.....	18.8	13.7

These requirements are not likely to be met in full during 1948. However, we should at least match and perhaps slightly better the export of 1947. In 1949 the situation should be somewhat easier. But no one will be surprised if refinery construction in Europe lags and more refined products are needed than plans call for.

The European Committee was careful to say these imports were from "dollar areas." That means they are supplied by American companies (who need payment in dollars), but not necessarily from the United States. As a matter of fact, almost 60% of Europe's oil in 1946 came from the Caribbean and the Middle East, as against 20% from the U. S. proper. American companies furnish much of this foreign oil and any increase in exports probably will flow from foreign supplies.

All this is not to say that the export of oil from the U. S. proper is not considerable. It is, with exports this year running at a rate of more than \$600 million. About \$250 million of this—chiefly refined products—has gone to Europe. From the standpoint of refining capacity alone, shipments of refined products from the U. S. could, in a pinch, be stepped up slightly. But capacity also should be available in the Caribbean and the Middle East. It makes economic sense to ship from these other areas and they should get the business.

## CHEMICALS AND FERTILIZER

Nitrogen fertilizer is the one U. S. chemical product high on Western Europe's priority list. Industrial chem-

icals and pharmaceuticals are wanted, but are not likely to be purchased in quantity if funds run low.

Nitrogen, of course, is in extremely short supply the world over. Moreover, this shortage probably will not be licked until the early Fifties. If Western Europe were to receive the full 319,700 tons of nitrogen it desires from the Western Hemisphere in 1948, consumption in the U. S. would of necessity be reduced. Not only would commercial exports have to be increased, U. S. imports would also decline. Large supplies (180,000 tons) from Canada and Latin America make the U. S. a net importer on commercial account.

The likelihood is that Western Europe will get more nitrogen next year than this. However, the advance will come out of a small expansion of production, leaving U. S. consumption what it was. From the U. S. some 70,000 tons (6½% of production) may be shipped. This would equal commercial exports to all areas in 1947.

The U. S. also will provide phosphates to Western Europe — perhaps 80 to 85,000 tons. However, production should be adequate to carry this with little trouble.

Among other chemical products, Western Europe would like the following (figures are millions of dollars).

	1948	1948-51
Industrial Chemicals .....	50	190
Paints and Pigments .....	40	145
Coal Tar products, Medicinals, etc. ....	160	515
	<u>250</u>	<u>850</u>

No forecast of our actual export of these products is possible. However, shipments are likely to run considerably lower than the above figures suggest. Western European production can fill the most essential needs. Since supplies here are very tight on many items, exports to Europe may not greatly exceed those of 1947.

## STEEL — STILL THE NO. 1 PROBLEM

No material caused more trouble for U. S. industry in 1947 than steel. The extent of the shortage in 1948 — and the possibility that it might end — has been a key element in the plans of many producers for next year. Under such circumstances the needs of Western Europe are bound to be weighed and measured with care.

Here is what the initial report from Paris asked for in the way of steel (figures in thousands of tons).

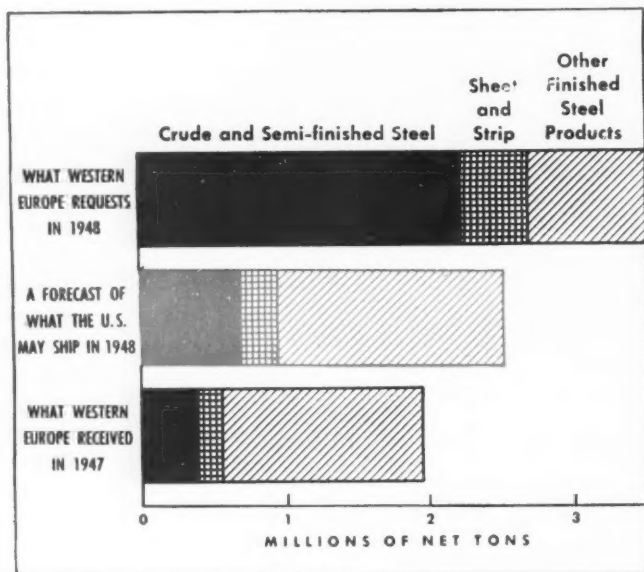
	1948	1949	1950	1951	Total
Ingots and semi-finished items.....	2,244	2,299	2,475	2,387	9,405
Sheet and strip.....	424	198	34	...	656
Tin plate.....	320	314	296	275	1,205
Other finished steel..	500	...	...	...	500
TOTAL .....	3,488	2,811	2,805	2,662	11,766
Steel scrap.....	1,500	2,000	2,300	2,500	8,300

At first glance these requirements don't appear too hard to meet. This year we have been sending steel abroad at the rate of 6.2 million tons annually. Canada and Latin America took more than 3.5 million tons of this. Europe took only about 2 million tons. Apparently the problem could be solved by shifting exports.

Unfortunately, the answer is not as simple as this. What Western Europe wants — it's really Britain and Italy that want it — are steel ingots and other semi-finished items (billets, blooms, etc.). These the U.S. has been consuming itself. Exports have been almost entirely in the form of finished products.

From the standpoint of the steel industry, shipment of semi-finished items has two bad results. Certain finishing capacity would be made idle. As a matter of fact, the amount of semi-finished steel Western Europe wants is 40% of the supply non-integrated producers of steel products have been able to get from the integrated producers (who turn out the ingots). In addition, badly needed scrap from the finishing process would be lost.

### The Dilemma in Steel



What we shall do about this hadn't been settled yet. Those of the President's Advisory Committee on Foreign Aid who specifically studied the question felt very little semi-finished steel should go abroad. This, however, would hit Western Europe hard. A likely compromise — and one suggested by the Government agencies reviewing Western Europe's requirements — would substitute finished items for semi-finished. Shipments of the latter in 1948 would be held to around 650,000 tons, less than a third of the initial request. But export of finished steel (other than sheets or tin plate) would jump to 1,150,000 tons. On one matter, however, all seem agreed. No straight scrap can be sent. The U.S. just doesn't have it.

Where does the steel consumer stand on all this? From his point of view the export of any steel makes life more difficult. No matter what is shipped he will feel it next year. Here is the probable situation under either the initial request or as it may be revised.

a) Overall the supply will remain about as tight as it has been this year. Although demand on the part of equipment producers is expected to decline somewhat, this will be offset by heavier requirements for construction, transport, and export. Late in 1948 and

early in 1949, addition of 2.5 million tons of basic ingot capacity may help somewhat.

b) Steel sheets will continue to be a headache, but probably slightly less of a one than in 1947. Long awaited additions to capacity are beginning to come in. By the end of 1948 the total should stand 3 million tons higher than at mid-1947 (a gain of about 18%). Western Europe probably won't get all it has asked for. Shipments might not exceed 225,000 tons, half the initial request. And most of the increase over the export this year (164,000 tons) is likely to come out of shipments that have been going to other areas.

c) Tin plate also seems destined to remain tight. But here the trouble is as much tin as steel. Exports this year are 561,000 tons, but only a fourth has been shipped to Western Europe. If Europe's requirement of 320,000 tons is to be met, other world areas will probably bear much of the burden.

### EQUIPMENT BOTTLENECKS — COAL EQUIPMENT

The equipment items are the toughest part of the Marshall program to assess accurately. The European Committee itself failed to develop any clear-cut list of what will be needed. The large sum labeled "mine equipment," for example, includes a certain amount of electrical apparatus. And no detailed breakdown whatsoever was initially presented for the broad equipment groups listed earlier. Some of these shortcomings will be rectified by information now being obtained. In the meantime, equipments lines where the added needs of Western Europe undoubtedly will cause difficulty can be earmarked.

Coal equipment is one such item. The total of \$80 million which Western Europe wants in 1948 is half again as much as our export to the entire world this year. Today order backlogs run from 6 to 24 months on many types of mine equipment. Fortunately, some that are most tight — mine locomotives, coal loaders, coal cutters (except the long wall type) — apparently are not wanted by Western Europe in quantity.

Equipment that is needed quickly includes pneumatic tools, conveyor belting, and long wall cutters. These are all adaptable to European mining and can relieve bottlenecks that now exist in supply. Conveyor belting is the most difficult of these items. However, the main trouble in meeting Western Europe's coal equipment needs may arise from another direction — the supply of machinery, parts, and materials for producers of mine equipment in Britain and on the continent. Without help, European plants can't meet the production schedules set for them.

### PETROLEUM EQUIPMENT

Western Europe may spend about \$130 million on U.S. petroleum equipment next year. This is three-fourths of what was originally planned, but it comes close to our total export of petroleum equipment in 1947. The entire expansion program projected by Western Europe's oil industry will run to some \$1.8 billion in four years, with a third for U.S. equipment.



Big items needed probably will include steel pipe and tubes, pumps of many sizes, large vessels (fractionating towers), turbo-generators, and well drilling apparatus and parts. Probably the most difficult problem here is steel tubing. Orders are now on the books for production into 1951. Very little has been exported, and what Europe gets in 1948 will clearly be at the expense of domestic consumers. Other trouble spots are pumps, turbo-generators and large vessels.

Our own petroleum industry is undertaking a record capital outlay on production and refining of about \$3 billion this year and next. Part of this is in the Middle East and Western Europe itself. Therefore Western Europe's oil industry will compete with American companies for scarce equipment and supplies. Such competition is to be expected in Europe, as well as here.

Since the American program is much further advanced, Western Europe's expansion plans may well lag. This certainly is likely to be the case in the Middle East. Almost half the U. S. equipment wanted by British and French companies is for projects in that area. Many of these require the help of American engineering firms, since U. S. engineers are most familiar with recent developments in installation and design. This engineering talent is itself a scarce element in the petroleum expansion scheme. It may prove the factor that sets a slower pace than Western Europe had planned.

#### **FREIGHT CARS — DELIVERIES LAG**

Freight cars for Germany are the only import of inland transport equipment which Western Europe urgently needs from the U. S. Production within the area can take care of most other requirements.

Import requirements initially were set by the European Committee at 103,000 cars, with 89,000 needed in 1948-49. European equipment is less than half the size of ours; so in terms of U. S. freight cars this boiled down to about 20,000 cars in 1948 and 19,000 in 1949.

Freight cars, of course, are one product whose need in the United States is urgent. Car builders have more than 100,000 cars now on order. Thus far their deliveries have failed to average more than 6,000 cars a month.

The President's Committee on Foreign Aid, surveying the tough situation here and in Germany, finally recommended a shipment in 1948 of 20,000 cars (the American equivalent is 8,000). To the extent this is met, American railroads will have to accept somewhat later delivery. The number involved is not great enough, however, to make any appreciable difference in the overall freight situation. This is likely to remain about as tight in 1948 as it has been this year.

#### **ELECTRICAL EQUIPMENT**

Equipment for Europe's electrical industry may prove less troublesome than originally expected. Western Europe plans to produce all the heavy apparatus required for its vast generating plant expansion — at least for the first several years. Thereafter, U. S. producers

will be in a position to help them if they need it.

The four year need for U. S. equipment originally was set at \$500 million. Some \$300 million of this is to be spent on items that do not include any heavy apparatus. Materials and equipment required by the electrical manufacturers themselves are on this list, although no details are given. Its exact effect on our own electrical industry can not be measured until we know more specifically what is involved.

The remaining \$200 million will go for hydro equipment on projects of an international character. These may possibly be financed by the World Bank and an immediate start on the equipment is probably not necessary. U. S. electrical equipment producers certainly could not get such work well under way for several years. But certain shipbuilding firms might begin on turbine equipment if desired.

If the electric equipment story ended at this point, it wouldn't be so bad. However, the above figures don't give the full picture. Large motors, turbo generators, and other items are also required for expansion in the petroleum, coal, and steel industries. In many cases these very products have held up the completion of new capacity in this country. Even without Europe's demand they would continue tight well into 1949.

#### **MACHINE TOOLS AND OTHER MACHINERY**

Western Europe hasn't set any fixed estimate of what it might spend on machine tools, construction machinery, and other equipment. If the entire program went as initially planned, about \$550 million would be available in 1948 for such products. However, the amount actually spent will probably be considerably less than this. No direct aid is likely to be given by the U. S. for the purchase of such equipment; so the countries concerned will have to use whatever funds they can scratch up themselves. How much this will be no one knows.

Machine tools are certain to bulk large on this list. Shipments to Western Europe in first-half 1947 were at an annual rate of \$75 million. They should be in larger volume next year. Western Europe appears to hold a fairly adequate stock of general purpose tools. But the expansion of capacity in a number of metal working lines, if carried through, will require a large variety of special purpose tools.

Machine tool needs can be met without difficulty. However, one group of products that might cause trouble is construction equipment. This has been in great demand here. While some items are approaching an easier supply position, others like cranes and power shovels remain very tight. Western Europe has spent a modest sum on U. S. construction equipment — \$16 million in the first six months of 1947 — but it would like to spend more. If it tries to do so, exports to Canada and Latin America may have to be cut.

Demand for U. S. textile machinery by Western Europe also has been relatively small — about \$7 million in first-half 1947. This situation is expected to continue.

with the region producing most of what it needs itself.

Steam engines, canning machinery, milling machinery, and a long list of other equipment items round out Western Europe's capital requirements. Most of these can be supplied without many of the difficulties reviewed above. And there is one product of great importance to America which Western Europe plans to satisfy largely from its own plants — automotive equipment, particularly passenger cars.

#### EQUIPMENT FOR THE FARMER

Western Europe's first request for farm equipment in the 1948-51 period was equal to our entire output of 1947. Since this amount obviously can not be spared, the request has been scaled down very substantially. In 1948 shipments are not likely to be more than \$100 million, with the new four year goal something on the order of \$600 million (half the initial figure).

American farmers can spare this amount of equipment in 1948, although they certainly would buy it themselves if it were not set aside for Europe. Production is likely to run to about \$1.35 billion, up some 10%

from 1947. But other foreign customers also will have a bid in for a part of this. Canada and Latin America, who bought some \$105 million of the \$175 million of farm machinery exported this year, need further equipment badly and cannot be shut off with nothing.

After meeting the European and other export demands, American farmers still should receive more new equipment than in any other year except 1947. Thus, they will continue to make considerable progress in their drive to mechanize, although the pace will be slower than they would choose. Above all, the demands of Western Europe and other countries should not be too large to interfere with U. S. food production.

#### THE FOOD SITUATION

Food may turn out to be one of the chief trouble spots of the Marshall program—particularly for American business. Because of the program, food exports will be larger, domestic consumption somewhat smaller, and prices higher than they otherwise would be. In spite of this, Americans should eat about as well next year as in 1947. However, if prices are bid up in the process, wages and industrial costs may climb with them.

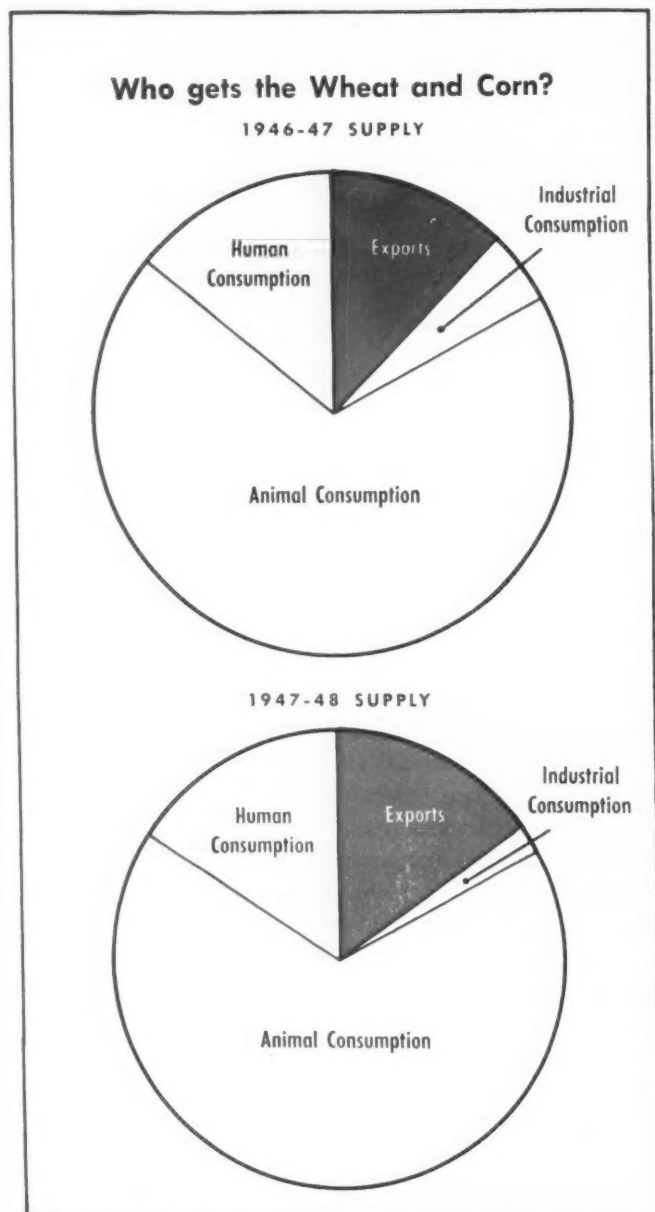
As matters now stand Western Europe would plan to spend about \$1 billion on U. S. food in 1948. This is less than they spent in 1947. It also is less than Western Europe feels is necessary to realize the minimum standard of living it set up as a goal for 1948. However, the overall supply of grains — by far the largest commodity on the food list — is down this year by 14%. As a result estimates of Europe's food imports have been reduced.

Here is what went into the record export in the fiscal year 1946-1947. (Figures are thousands of long tons).

	Shipments to Europe 1946-7	Total Exports 1946-7
Wheat and Flour (grain equivalent)	6,638	10,520
Other grains	2,572	4,538
Fats and Oils	156	233
Meat (carcass weight equivalent)	195	224
Dairy Products	322	493
Other Foods	1,266	2,425
Total Foods	11,149	18,433

The President's Committee on Foreign Aid has recommended Europe receive about the same total foodstuffs as last year. However, the product mix will have to be changed. Moreover, the rest of the world will get about a million tons less. Wheat will substitute for corn, but even then the total supply of grains available to Europe will be down 700,000 tons or more. Half of this may be made up with a heavier shipment of fats and oils, including peanuts. Dried milk solids, dried fruits and other products will close the rest of the gap.

There is no doubt the U. S. can send abroad whatever foodstuffs Congress finally agrees upon. The big question is whether this can be done without forcing prices higher. Wheat shipments, for example, may run 40% greater than would normally be exported under current circumstances.



Unfortunately no final answer on food prices is possible. On the supply side much will depend on how next years crops turn out. So far crops are off to a bad start, with winter wheat probably below that of a year ago. As for domestic demand, consumers are likely to have at least as much purchasing power next year as this. The problem is to persuade them to use it on commodities that embody less grain.

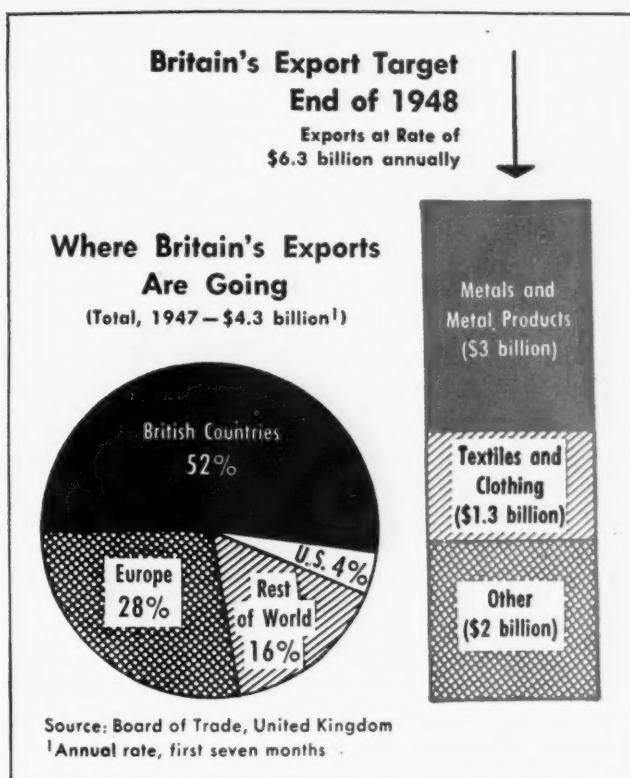
When all these considerations are added together it is apparent that food prices over-all do not stand much of a chance to fall markedly in 1948. On the contrary, there is more than a small chance they will rise. Moreover, under the Marshall program exports in 1949-50 would still help support farm and food prices. Any substantial decline could be initiated only by a fall in domestic consumption. Needless to say, these are matters that are important to the business community.

## Long Range Problems

A PROGRAM of the size Western Europe has set for itself inevitably will influence American business over the longer run. New industries are to rise, old ones are to be rebuilt and expanded, exports are to be pushed — all this has a direct bearing on America's foreign markets of tomorrow. Any sound and final judgment concerning the Marshall program, therefore, must weigh certain long run considerations as well as the short.

These longer range considerations are summed up most simply in an assessment of the broad pattern of Europe's future trade. Here a few key trends serve as useful signposts. They are:

- Industrially Western Europe is preparing to make itself more independent than before the war. This will reduce its imports from the United States. After 1951 export of American manufactures to Europe will be concentrated largely in specialized items which this country has a superior knowledge and skill to produce.
- Prior to the war Western Europe was primarily an exporter of textiles, industrial products and high quality consumer goods. Industrial revival is along the lines that will push these same products. However, Western Europe's program for expanding industrial capacity points to one significant modification. Capital goods exports — electrical equipment, industrial machinery, finished steel — will bulk much larger than at pre-war.
- Western Europe's world trade must be considerably larger than in the late thirties. Two developments account for this. First the split in Germany and Europe makes necessary a much larger import of essential foodstuffs and materials from outside the Continent. Second, Europe now must pay for a larger share of its imports with exchange derived from exports. In the Thirties, about one-sixth of Europe's imports represented a return on investments held abroad. While this margin is not eliminated, it has been cut substantially.



- By far the largest items on Western Europe's import list will be foodstuffs and raw materials. These needs to some extent must govern the location and character of the markets to which it exports. The U. S. must continue to be one such market, for Europe will need our wheat.

A survey of Western Europe's import needs in 1951 shows that Britain and Western Germany are the two countries to whom world trade will be of decisive importance. Other countries will trade as they always have. However, their ability to feed themselves to a large extent lessens their trade burden and makes possible the concentration of much of it within Western Europe itself. It is Britain and Germany, therefore, that are likely to become America's heaviest competitors.

Britain has the world's greatest food deficit. Moreover, its factories are largely engaged in converting the raw materials of other countries into finished goods. Britain therefore must export or die, and that is more true today than ever. The British now have set an export goal that would boost shipments to 175% of their pre-war volume. Later they may pare this. Nevertheless, an export volume at least half again that of pre-war will be necessary for Britain to restore its living standard.

Some clues to what and where Britain will export are available in its current trade pattern (see chart). A close study of this pattern leads to one broad conclusion. The British are concentrating on the export of the same general lines which the U.S. will push. Machinery, automobiles, iron and steel products, electrical goods — these are items that even today stand high on the export lists of both Britain and the United States. Britain in particular must turn to durable goods of this character to replace smaller coal and textile exports.



Prior to the war Britain sought to direct exports primarily to two areas — her empire and Western Europe. Except for foodstuffs from Argentina, British imports from South America were small. This situation has not changed, and there is good reason to believe Britain will seek to maintain it. As the chart shows, about half Britain's postwar exports have been allocated to the Empire, and another quarter to Europe.

Other than in Canada, U. S. firms find it hard to get into this Empire trade. Empire countries have large sterling balances and lack dollars. It is not surprising, then, that they use dollars chiefly for goods Britain can not itself deliver. Such a situation may well last.

The German position is somewhat different, but not radically. Today Western Germany's population of 48 million is almost a fourth greater than in the late thirties. Yet the region can produce little more than half the food it requires. Unlike Britain it must start from scratch in order to develop export markets so as to pay for its food.

Coal will be one money maker for Germany, but it won't earn exchange in all places from which Germany must buy. A likely development is the resumption of shipments of those metal products and chemicals which the Ruhr can produce efficiently and in quantity. Iron and steel products, machinery, chemicals and possibly electrical equipment might be expected to flow from German plants for sale on other continents.

South America, with its food and raw materials, is a natural target for German trade. Such an exchange grew rapidly in the twenties, only to fall victim to the great depression. By the late thirties it was again on the road to revival. The third great push for German-Latin American trade is expected in the fifties.

#### THE FAR EAST

With Britain enlarging its trade to the Empire and Germany coming into other markets, U. S. traders certainly will feel a competitive pressure that is not present today. How tight that pressure is may hinge on developments in yet another region — the Far East.

The Far East is a vast agricultural and raw material area that has hardly moved to the threshold of industrialization. Yet it has great centers that lend themselves to industrial growth. If political stability were to be established in the Far East, the way would open to a trade greatly benefitting both Europe and the United States, as well as the Far East itself. A surplus of rubber, tin, cotton, wood fibers, and even foodstuffs might then be produced and exchanged for the industrial products of the West.

The Far East, then, is one of the big unknowns in the foreign trade equation of the next decade. Another unknown is the reestablishment of trade between the

East and West of Europe. Western Europe's plans count on such trade, and it makes good economic sense. But no one can say for sure that economic sense will prevail in this instance.

These unknowns make any final judgment about the long range success of the Marshall program impossible. This much is certain, however. Without the restoration of East-West trade in Europe, a large expansion of Far East trade becomes an absolute essential. In the absence of both, Western Europe cannot possibly achieve stability by 1952.

#### Pros and Cons

ANY BALANCE SHEET set up by the business man on the Marshall program will carry a number of items on the liability side. Some of the main entries are these:

The program will be costly — perhaps as much as \$15 billion. Through their tax bills business men will bear a good share themselves.

At least for 1948 a number of troublesome bottlenecks will be sustained and even magnified. As a result some producers won't realize the expansion they plan.

The high cost of living, the peg on which many labor troubles hang, will move down very little, if at all, and it may move up.

In helping Europe to reequip itself, American industry is arming a potential competitor. Moreover, the arms it offers are of the most up-to-date variety.

There is no guarantee the program will succeed; as a matter of fact certain conditions essential to its success make it look like a risky bet indeed.

Obviously none of these shortcomings can be taken lightly. Against them, however, can be placed some very weighty items on the asset side.

First, and very important, is the simple but humane consideration that without U. S. aid people in a number of Western European countries will be placed in dire straits. At best they will lack adequate food for a healthy life. At worst they will starve.

The economic situation in Western Europe has a profound political and military meaning for the U. S. This is a matter of direct interest to the businessman. If Western Europe ever loses its political independence to another foreign power, the ultimate cost to America will make the expense of the Marshall Plan look like a mere pittance.

Finally, the Marshall program offers the only hope of realizing some measure of economic stability in a world that today appears permanently upset. In this regard the program can do no harm, but only good. Even if it falls short of its stated objectives, Western Europe will have taken a long stride forward.

The assets outbalance the liabilities.

Reprints of this report are available at a charge of 20¢ each to cover the cost of handling and mailing. Address orders to Department of Economics, McGraw-Hill Publishing Co., Inc., 330 West 42nd Street, New York 18, N. Y.

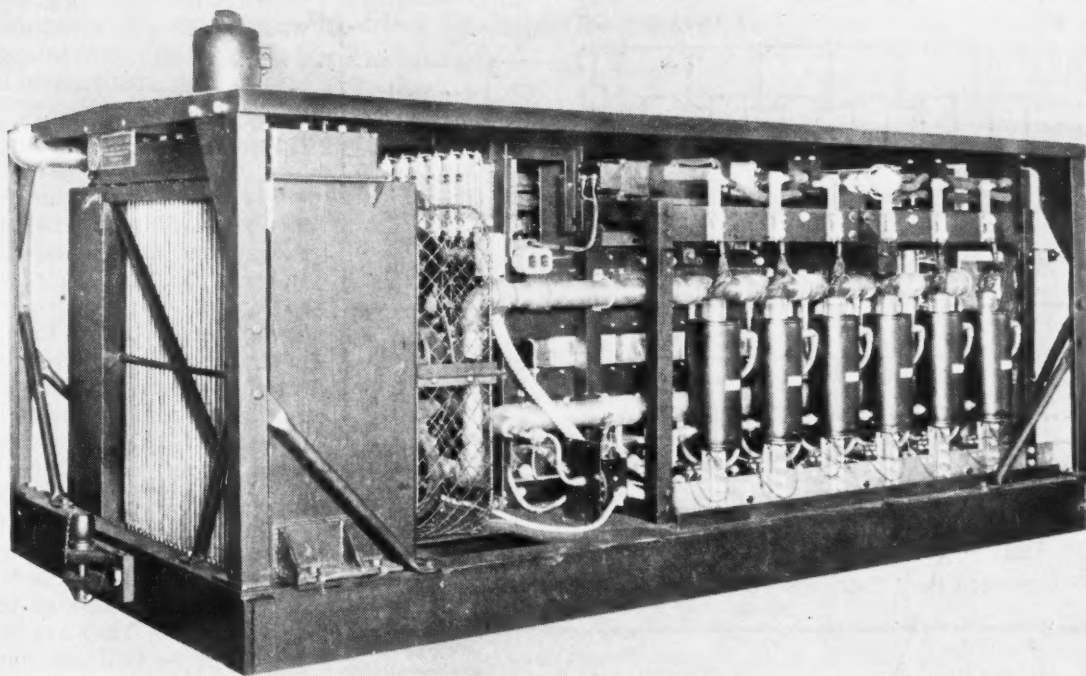


FIG. 1—RECTIFIER CAR for portable underground mining rectifier.

# Preventing Rectifier Corrosion

Types of Corrosion Encountered with Sealed Ignitrons—  
Effect of Potential Difference Across Piping and Its Elimination — Recommended Anti-Freezes and Corrosion Inhibitors—Electrolytic Targets

By D. W. BORST

Power Electronics Division, Industrial Engineering Division  
General Electric Co., Schenectady, N. Y.

COOLING the sealed ignitrons in mercury-arc rectifiers of this type by recirculating a coolant through the ignitrons and a heat exchanger is the general practice that has developed in the mining industry. Heat exchangers usually are of the water-to-air type and, since the rectifier frequently is located in an unheated building, an anti-freeze compound is added to the cooling solution during the winter. The practice of using heat exchangers has grown despite the fact that sealed ignitron rectifiers installed in other industries generally are cooled by the direct application of tap water to the ignitrons. Mining practice derives from a lack of suitable cooling water in sufficient quantities at most coal mines.

Mining rectifiers are built along two general lines. One type is the portable unit specially developed for use underground. The rectifier tubes and heat exchanger are mounted on one of the three cars which make up these portable substations. One view of such a rectifier car is shown in Fig. 1. The other type is the more conventional stationary rectifier, such as shown in Fig. 2, which is used in surface installations where head room is no problem. A representative heat exchanger for such a rectifier is shown in Fig. 3. The appearance of this

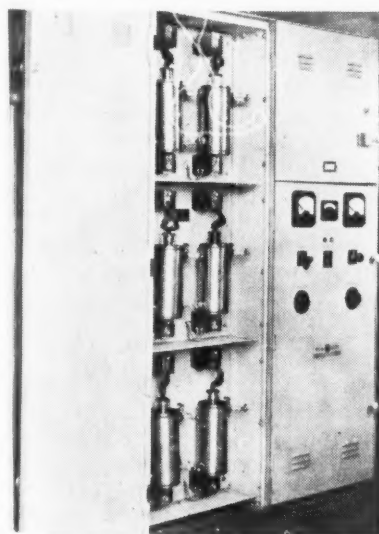


FIG. 2—SURFACE-UNIT substation-type mining rectifier.

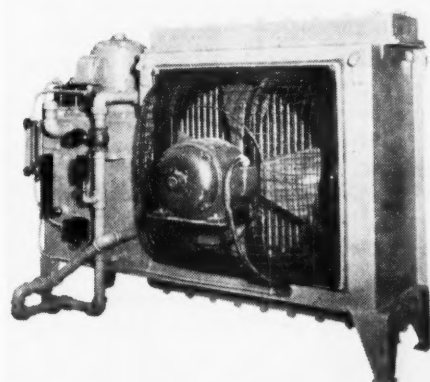


FIG. 3—WATER-TO-AIR heat exchanger for surface-type rectifier.

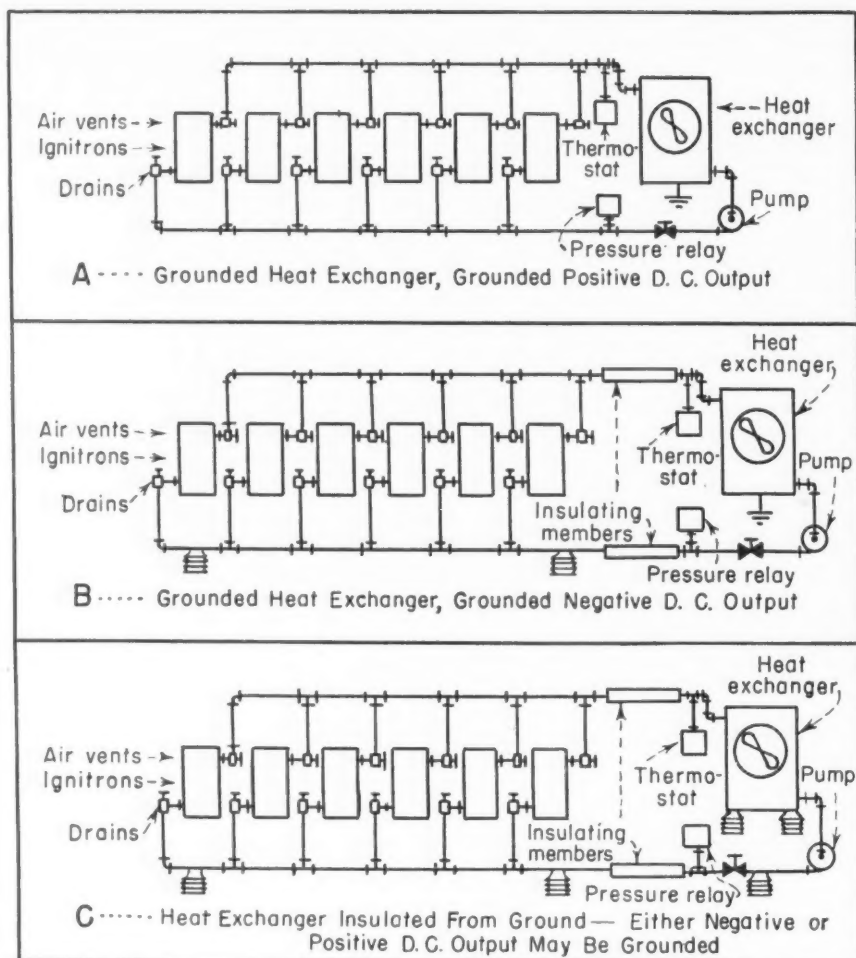


FIG. 4—ARRANGEMENT of piping for sealed ignitron rectifiers.

rectifier is similar to the d.c. load-center substation found in many industrial plants today.

### Types of Corrosion

Where water is recirculated through a cooling system, as in these rectifiers, there is the possibility that corrosion of metallic parts of the system will be accelerated because of the accumulation of impurities in the cooling solution. In addition, atmospheric-type corrosion of ferrous parts can result from oxygen becoming dissolved in the cooling solution. This may cause iron piping to scale and pit and, if sufficient scale is formed, it may clog up the smaller pipes and cut off the supply of cooling water to one or more of the sealed ignitrons. Corrosion inhibitors are available which, under some conditions, can be added to the coolant to prevent atmospheric corrosion, as well as corrosion from impurities in the cooling solution. One type of corrosion inhibitor that has found widespread use in mercury-arc rectifiers is sodium chromate.

In addition to the possibility of corrosion from impurities in the

water, and from dissolved oxygen, piping may be damaged by electrolysis if the rectifier is installed so that a d.c. electrical potential appears across part of the piping system. When an electric current is passed through a water solution, oxygen may be liberated at the positive terminal. This free oxygen can then combine with adjacent metallic parts, causing electrolytic corrosion. If uncontrolled, this corrosion may destroy part of the piping system very quickly and permit the rectifier coolant to escape. Escaping coolant may cause additional damage to the rectifier by injuring transformers and reactors near the part of the piping that fails. In rectifiers where electrolytic attack of the piping is taking place, the addition of a corrosion inhibitor may greatly increase the rate of attack.

A fourth type of corrosion arises out of the anti-freeze which must be used when the rectifier is subjected to freezing temperatures. Under the influence of electrolysis, some anti-freeze compounds turn acid and attack the rectifier piping. Also, if a corrosion inhibitor is used, it may prove unstable when

mixed with some anti-freezes, in which case the inhibitor will be destroyed and the piping can be attacked by atmospheric corrosion.

### Arrangement of Piping Systems

Three piping arrangements commonly used in rectifiers having heat exchangers are shown in Fig. 4. In each case, the piping is arranged so that water from a pump will first flow through the cooling passages in the sealed ignitrons and then through a heat exchanger, where the heat picked up in the ignitrons is removed. The important differences among these three systems result from the way in which they are grounded, as well as the use of insulating members in two of them. These insulating members may be made of rubber hose or plastic insulating pipe. They are inserted in the piping so that one part of the cooling system may be at a different electrical potential from the other. Whether or not this difference of potential appears across the piping of a given rectifier is an important distinction, since many of the decisions concerning the corrosion inhibitor and anti-freeze to use are based upon whether or not this potential difference exists.

Since the water jacket of each sealed ignitron is at the electrical potential of its mercury-pool cathode, the piping associated with these tubes will be at positive d.c. potential for all except very special types of rectifier power circuits. If the heat exchanger is grounded and the positive d.c. output of the rectifier also is grounded, all water piping will be at the same d.c. potential—that of the ground. Consequently, no insulating member is required in the cooling system. This condition is shown in A, Fig. 4.

If the heat exchanger is grounded and the negative d.c. output of the rectifier also is grounded, then insulating members must be included in the rectifier piping to isolate the heat exchanger from the ignitrons. Otherwise, a d.c. short circuit will result. This arrangement is shown in B, Fig. 4.

The third possible arrangement—heat exchanger insulated from ground—is shown in C, Fig. 4. With this arrangement it does not matter whether the positive or negative d.c. output of the rectifier is grounded since no part of the rectifier piping system is grounded. Insulating members are shown between the heat exchanger and the ignitrons. These insulating members are not necessary for proper oper-



## Coolant Schedule for Sealed Ignitron Rectifiers With Heat Exchangers

Electrical Classification	Piping-System Materials	Anti-Freeze	Season	Recommended Coolant
Potential difference across piping (electrolysis present).	Galvanized iron or iron pipe, or non-ferrous copper-bearing pipe; brass fittings; stainless-steel, copper or iron targets.	Not to be used	All year	Pure water only; replace when resistivity falls to 5,000 ohm-centimeters.
		To be used	Summer	Pure water only; replace when resistivity falls to 5,000 ohm-centimeters.
			Winter	Pure water and methyl alcohol; replace when resistivity falls to 5,000 ohm-centimeters.
	Black-iron pipe; brass fittings; iron targets.	Not to be used	All year	Pure water and 0.1% sodium chromate may be used only if recommended by manufacturer; otherwise, refer to instructions at beginning of this table.
		To be used	Summer	Pure water and 0.1% sodium chromate if recommended by rectifier manufacturer.
			Winter	Pure water, methyl alcohol and 0.1% sodium chromate if recommended by rectifier manufacturer.
No potential difference across piping (no electrolysis present).	All piping materials; no targets required.	Not to be used	All year	Pure water and 0.1% sodium chromate.
		To be used	Summer	Pure water, 0.1% sodium chromate and 1.0% borax.
			Winter	Pure water, methyl alcohol, 0.1% sodium chromate and 1.0% borax.
			Summer	Pure water and 1.0% borax.
		To be used as an alternative	Winter	Pure water, ethylene glycol and 1.0% borax.

Notes: Pure water is water having a minimum resistivity of 30,000 ohm-centimeters. Anhydrous sodium chromate ( $\text{Na}_2\text{Cr}_2\text{O}_7$ ) must be used to obtain correct proportions. Borax ( $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$ ) may be "20 Mule Team" brand or equivalent. For systems with 30-gal. capacities, 1.0-percent borax is  $2\frac{1}{2}$  lb. and 0.1-percent sodium chromate is 4 oz.

ation of the rectifiers. They nevertheless are desirable because, if the rectifier is operated with the negative d.c. grounded and the heat exchanger is accidentally connected to ground, a power short circuit will be prevented. If a heat exchanger becomes accidentally grounded in this way, the ground should be removed as quickly as possible since otherwise the piping system reverts to that shown in B, Fig. 4, and injury to the piping may result.

With a piping system such as shown in B, Fig. 4, where a difference of potential exists across insulating members, electrolytic current will flow through the cooling solution in the insulating members. The magnitude of this current will depend upon the d.c. voltage output of the rectifier, and also upon the

resistance of the column of cooling solution in the insulating members. This resistance is dependent upon the length and cross-section of the insulating members and upon the specific resistivity of the cooling solution.

### Piping-System Materials

Rectifier piping systems also can be classified according to the materials used in fabricating them. Materials which have been used in sealed-ignitron mining rectifiers include black-iron pipe and iron parts in the heat exchangers and water pumps, and galvanized-iron and non-ferrous copper-bearing pipe. In some rectifiers, two or even all three types of pipe may be found. For instance, copper pipe may be

used where flexibility is important, such as for the small-diameter connections to each ignitron. In the same rectifier, iron may be found in the heat exchanger and pump, and galvanized iron may be used for the larger pipes in the system.

The cooling passages of sealed ignitrons are made of stainless steel and brass unions are used for coupling to the ingoing and outgoing water pipes.

### Recommended Cooling Water and Corrosion Inhibitors

Pure water is recommended for all rectifier cooling systems and is demanded in systems where a potential difference exists. Pure water is defined as water having a resistivity greater than 30,000 ohm-centimeters. Distilled water falls in this class; also steam condensate and similarly prepared waters that approach the purity of distilled water.

When pure water is the coolant, the preferred inhibitor against atmospheric corrosion is 0.1-percent anhydrous sodium chromate. For the usual mining rectifier with a 30-gal. cooling system, 4 oz. of the inhibitor is required. Sodium chromate tends to keep the coolant alkaline, which retards atmospheric corrosion. In addition, it forms a protective coating on black-iron parts, so that corrosion of these parts is practically eliminated. If a black-iron part is acting as the collector of a few milliamperes of electric current passing through the coolant, the protective coating will be maintained and the black-iron part will not suffer from electrolysis. Copper, brass and galvanized-iron parts are not similarly protected. For this reason, it is best not to employ sodium chromate in a rectifier where electrolysis can take place unless the rectifier manufacturer specifically recommends it.

One percent by weight of borax also may be used in pure water to inhibit atmospheric corrosion. Forty ounces ( $2\frac{1}{2}$  lb.) is required for 30 gal. of water. Its main action is to keep the cooling system alkaline. Consequently, it is not as effective as sodium chromate.

### Recommended Anti-Freezes and Corrosion Inhibitors

When it is necessary to add an anti-freeze to the rectifier cooling solution, care must be taken to select the correct type for the cooling system involved. If a difference of potential exists across the pip-

ing, there is no known combination of anti-freeze and corrosion inhibitor that will perform satisfactorily. Sodium chromate, if used in such a system, will be destroyed by the anti-freeze. Other inhibitors may not be destroyed but, since they usually lower the resistivity of the coolant, electrolysis is very likely to increase and piping may be damaged, either from electrolysis or from electrolytic destruction of the anti-freeze and formation of acids.

When electrolysis is present, the best anti-freeze from the corrosion standpoint is a mixture of methyl alcohol (methanol) and pure water. During the summer these rectifiers should be operated with pure water only. When operating a cooling system this way, there is bound to be some atmospheric corrosion. However, if the coolant resistivity is kept high by frequently draining and replacing it, deterioration of the piping usually can be kept reasonably low. In rectifiers employing non-ferrous piping, atmospheric corrosion will be somewhat less of a problem. However, if there are iron parts in the cooling system, such as an iron surge tank or heat-exchanger parts, the coolant should be changed every few months.

Two objections are sometimes raised to using methyl alcohol for an anti-freeze: inflammability and high rate of evaporation. Ethylene glycol, a material widely used in general anti-freeze applications, is non-inflammable and has a much lower vapor pressure, which results in a lower evaporation rate. For these reasons, solutions of ethylene glycol and pure water have been used in rectifiers where electrolysis exists. Experience shows that severe corrosion of the rectifier piping can take place under these conditions, since electrolysis causes the anti-freeze to turn acid. For this reason, ethylene glycol should not be used when electrolysis is possible.

In rectifiers where electrolysis does not exist, a mixture of pure water, methyl alcohol, 0.1-percent anhydrous sodium chromate and 1.0-percent borax makes the least corrosive anti-freeze solution. For cooling systems holding 30 gal. of solution this is 4 oz. of sodium chromate and 2½ lb. of borax. In this solution, the sodium chromate protects black-iron parts the same way it does in pure water. In the unlikely event that an acid is formed by reaction of the sodium chromate with the methyl alcohol, the borax will keep the solution alkaline and prevent any possibility of corrosion.

When using this anti-freeze, it is suggested that each fall the rectifier be completely drained and filled with the desired proportions of methyl alcohol and pure water to which have been added the sodium chromate and borax. During the winter, methyl alcohol and pure water should be added in the quantities required to maintain the desired proportions, as determined by measuring the specific gravity of the solution. In the spring, the methyl alcohol may be permitted to evaporate, only pure water being used for make-up. The solution which results can then be used all summer, since the sodium chromate and borax will remain if there have been no leaks in the piping. In the fall, the coolant should again be drained and the rectifier refilled with the anti-freeze, pure-water, sodium-chromate and borax solution.

If the evaporation rate of the methyl-alcohol anti-freeze proves too great in any given rectifier installation, ethylene glycol, pure water and 1.0 percent of borax by weight may be considered. This solution is not as safe from the viewpoint of corrosion since sodium chromate is not included. Ethylene glycol and sodium chromate react to form an acid, and so may not be used together. Therefore, during the summer 1.0 percent borax is the only corrosion inhibitor which may be used. If it is desired to use ethylene glycol in a rectifier which has, at any time, been operated with a solution containing sodium chromate, all traces of this inhibitor must be removed by mechanical and chemical cleaning or else the ethylene glycol may cause corrosion of the unit.

It is not recommended that a given ethylene-glycol solution be used more than one year because of the increased likelihood of acidity developing when the solution is used longer. Unless the rectifier is lightly loaded, it will not be possible to leave the ethylene glycol in the rectifier during the summer, since heat will not be removed from the sealed ignitrons at a fast enough rate. Thus, when ethylene glycol is used it must be drained every spring and a solution of pure water and borax added for the summer. In the fall, this solution must be discarded to add the anti-freeze. This extra work, plus the greater cost of the ethylene glycol, usually offset the disadvantage of higher evaporation characteristic of methyl alcohol.

In the foregoing discussion of

anti-freeze compounds it is important to note that no commercial type anti-freezes have been mentioned. Where electrolysis is present, commercial anti-freezes may not be used since they contain various corrosion inhibitors which will increase the electrolysis. Commercially pure methyl alcohol, therefore, should be obtained for rectifiers of this type. Where a potential difference does not exist, the use of commercially pure chemicals is the safest practice, although it is possible that certain of the well-known commercial anti-freeze compounds may be used safely in place of the mixtures recommended above. Not enough experience has been gained so far, however, to permit any definite recommendations on such applications at this time.

### Removing Potential Difference

From the preceding discussion, it can be seen that cooling systems designed so as not to have a potential difference across them are the only ones that can be completely protected against all forms of corrosion. The owner of a rectifier which has a potential difference across the piping may eliminate this potential in one of two ways.

From the standpoint of the work required at the rectifier substation, the easiest alternative is to operate the rectifier with the positive d.c. grounded, thus reversing the polarity of the d.c. in the mine. After switching the ground connection to the positive d.c. connection from the rectifier, it is necessary to reconnect the d.c. contactor and disconnect switch so that they are in the negative d.c. connection. It also is necessary to relocate certain of the control wiring in the d.c. switchgear to permit the d.c. voltmeter and ammeter to read up-scale, and to permit the d.c. voltage regulator to function properly. Also, the heat exchanger should be bonded to the positive rectifier connections.

After reversing the polarity of all rectifiers in the mine, any m.g. sets or rotary converters also should be reversed. This usually means reversing the ammeter and voltmeter connections and flashing the m.g.-set fields.

If, for some reason, it is not possible to reverse the polarity in the mine, then it is necessary to insulate the heat exchanger and all parts of the rectifier piping from ground if the potential difference is to be eliminated. In a rectifier rated 300 volts or less, this may be done by supporting all the piping



and heat exchanger parts on suitable insulators. It also is desirable to inclose the heat exchanger and exposed metallic piping parts in a grounded, screened enclosure to prevent operating personnel from coming in accidental contact with the live parts.

If the rectifier is rated at more than 300 volts d.c., then, in addition to insulating the piping and heat exchanger, it will be necessary to supply the a.c. power which runs the pump and fan motors through an insulating transformer. This is because the 220-volt power system for these motors usually is grounded at some point and the motor insulation is not adequate to withstand a total of 220 volts a.c. plus something over 300 volts d.c. between the windings and the frame.

### Electrolytic Targets

Cooling systems in which electrolysis can take place often are equipped with electrolytic targets. These targets are intended to act as collectors of the electric current flowing in the cooling solution, and to localize the electrolytic attack which may result.

The proper choice of target material depends upon the cooling solution in use. If the coolant is pure water, then copper or stainless-steel targets are satisfactory. However, if the electrolysis is mild enough so that sodium chromate may be used to prevent corrosion, the best target material is iron. Stainless steel and copper targets will be destroyed by the sodium chromate and the destruction of copper targets can be quite rapid.

Platinum-wire or platinum-clad targets appear to offer very long life and for this reason are being investigated. However, their use appears to be limited to larger rectifiers, especially those rated above 3,000 volts d.c., where the high initial cost of platinum can be more readily justified.

Under all operating conditions, electrolytic targets must be inspected at regular intervals for reduction in length or formation of a high-resistance coating which will reduce their effectiveness.

The recommendations concerning coolants, anti-freezes, and targets for rectifiers having heat exchangers are condensed in Table I. Adherence to these recommendations at a given rectifier installation will minimize the danger of attack on the rectifier piping and the operating difficulties resulting therefrom.

### Cleaning Cooling Systems

Corroded rectifier cooling systems should be thoroughly flushed out with tap water to remove all loose rust and scale before adding a solution containing a corrosion inhibitor. It is wise to open the heat exchanger and surge tank and remove corrosion products that may have accumulated there. Damaged pipes and fittings should be replaced. A final rinse with pure water should precede filling the rectifier with the operating solution.

Chemical cleaning solutions can be made up to effectively remove all rust and scale, but their use is rendered difficult in the field because of the difficulty of transporting sufficient rinsing water to the rectifier site. All traces of these chemicals must be removed by first employing a neutralizer and then flushing repeatedly. In addition, the cleaning action is so complete that many small leaks may be created in pipes which otherwise might remain intact if operated with a coolant containing sodium chromate. It is believed that sodium chromate will prevent further corrosion in spite of corrosion products adhering to the piping. The main concern, therefore, is to remove the loose scale which can clog up the smaller pipes and cooling passages.

For those who may wish to attempt chemical cleaning in spite of the previously mentioned obstacles, the most promising solution today is 5 percent by weight of sodium bisulfate, 2½ percent by weight of anhydrous oxalic acid and 1/100 percent by weight of one of the standard commercial solutions that reduces the action of the cleaning solution on bright metal surfaces.

The cleaning solution should be circulated in the rectifier for several hours and held at a temperature of 55 to 60 deg. C. by energizing the immersion heaters usually found in the surge tanks. The exact time required for cleaning will depend upon the quantity of corrosion products that must be removed. A sample of the cleaner taken at intervals will help determine the point where the cleaning is complete.

After draining the cleaning solution and rinsing once with tap water, the system should be rinsed with a 2½-percent solution of sodium carbonate to neutralize any cleaner that remains. Then, three or four tap water rinses must be performed to remove the neutralizer before the system is ready for the final pure-water rinse and then

the addition of the operating coolant.

### Water-to-Water Exchangers

Some rectifiers are provided with water-to-water heat exchangers where there is an adequate source of cooling water but the water is not high enough in quality for direct application to the rectifier tubes. There usually is no anti-freeze problem with these heat exchangers since there seldom is danger that the rectifier coolant will freeze when a source of running water is present. These heat exchangers should be operated insulated from ground so that a corrosion inhibitor may be added to the coolant.

This method of operation will necessitate insulating piping members in the raw-water piping of the heat exchanger to electrically isolate the grounded raw-water piping from the heat exchanger—unless, of course, the positive d.c. is grounded. Electrolytic targets should be installed on the heat-exchanger side of these insulating members to prevent deterioration of the raw-water piping as a result of leakage currents. Copper or stainless-steel targets should be used. Corrosion products in the raw-water side will not present a serious problem, since the water is used but once and then discarded.

Raw-water piping may become clogged with sediment and impurities after a number of years of operation. This usually is because of some peculiarity in the raw water and can be corrected only by obtaining the water from a different source, or by treating it to remove the impurities causing the trouble. Otherwise, the raw-water piping must be cleaned regularly.

Experience over the past several years with water-piping systems in mercury-arc rectifiers having heat exchangers has permitted the formulation of operating practices which, if followed, will result in long life and good operation of the rectifier equipment. These practices reflect the importance of knowing which type of rectifier piping system is in use in a given installation and of selecting the best cooling solution and anti-freeze compounds to use. The value of eliminating a potential difference across part of the rectifier piping has been emphasized since only if this is done can the operator select a coolant that will render the rectifier cooling system safe from all types of corrosion attack.





CHRISTOPHER NO. 6 surface plant. At the left is the headframe for the new man and supply shaft fitted with a 15-ft.-long cage. The stiff leg at the left end of the tippie was added after a trestle to the hillside was dismantled.

## Alloy Cage Dumps Sideways

Replacing Two Old Units with Single Light-Alloy Cage Dumping Sideways Permits Hoisting Large Cars at Christopher No. 6 Without Shaft Enlargement—Capacity of Operation Raised to 6,000 Tons per Day

By J. H. EDWARDS

Associate Editor, Coal Age

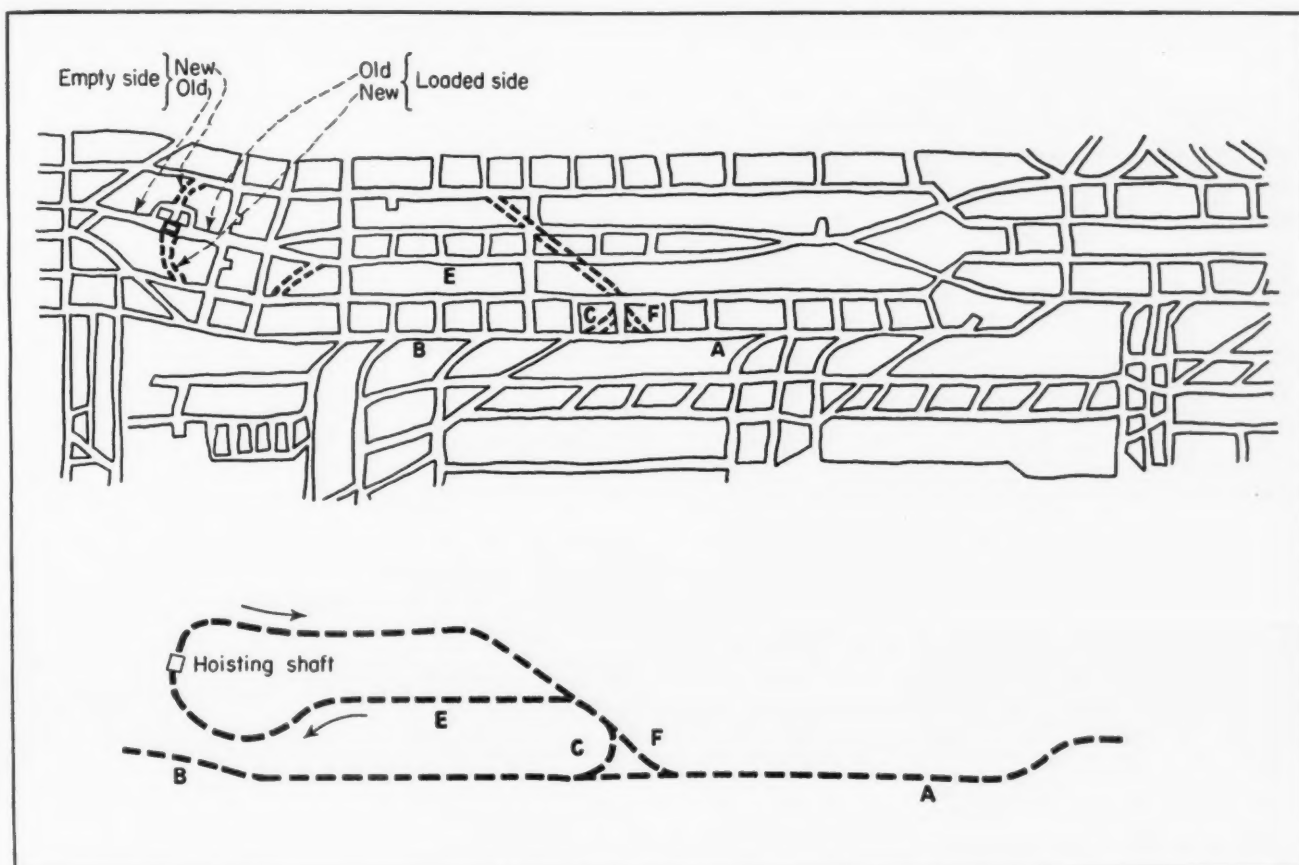
UNIQUE ALTERATION of the hoisting shaft without enlargement has made it practicable to hoist new steel cars carrying over 6 tons of machine-loaded coal as compared to the original wooden cars averaging approximately 3 tons hand loaded at the Christopher No. 6 mine, Four States, Marion County, W. Va. An overturning side-dumping cage of aluminum alloy weighing but 60 percent that of a comparable steel cage is a feature of the job. The original steam hoist, previously converted to an electric unit for

hoisting 3-ton steel cars, was fitted with a redesigned drum which, with installation of a counterweight, made it possible to use the same motor.

When the mine was taken over by the Christopher Mining Co. in November, 1942, it had been down eleven years. When last operated, the equipment consisted of the original compressed-air cutters and locomotives. The 1916 Keystone Directory listed it as Annabelle Mine of the Four States Coal Co. and gave the previous year's tonnage as 600,000. The tippie was

a large steel structure equipped with shaker screens and loading on four tracks. Platform cages were used for hoisting and the cars were run off to a crossover dump in the top of the tippie.

When the Christopher Mining Co. took over the plant the inside of the tippie was modernized and the old 7x12-ft. cages were adapted to handle, on a temporary basis, 3-ton steel cars, transferred from Lincoln mines of the Lincoln Gas Coal Co., Washington, Pa., which the Christopher company had purchased a few years before and had worked 3½ years to completion. A 400-hp. 2,300-volt induction motor and contactor control from that worked-out property also were utilized to convert the Christopher No. 6 steam hoist to electric operation. A post brake built by Robt. Holmes and a Lilly safety governor were added. Seven Sullivan 7AU track-mounted cutters and 15 Joy 11BU loading machines were installed in the mine. The Joy machines load directly into mine cars.



NEW CHUTES DRIVEN to handle cars lengthwise to the shaft are shown by broken lines in the upper drawing. The bottom drawing (to the same scale) indicates the new travel of loads and empties.

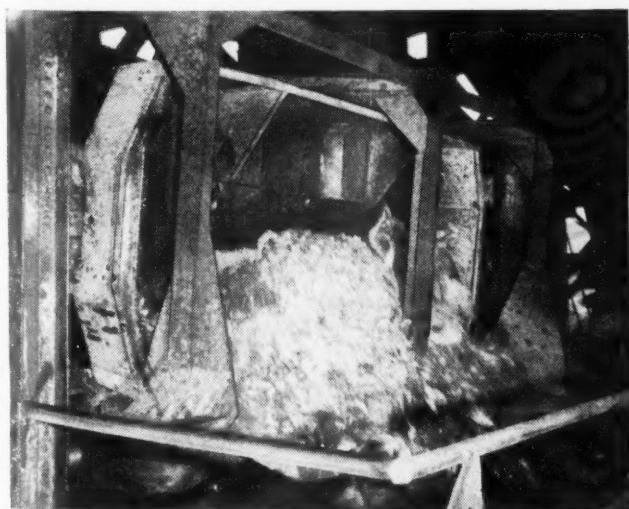
Another improvement was the sinking of a 310-ft. man-and-supply shaft close to the tippie. The large cage, 8x15 ft., has a capacity of 20 men and is advantageous in handling large equipment and crossbars.

Some 2½ years ago, F. E. Christopher, president, and Lee Christopher, operating vice president, began to plan changes that would increase the efficiency of loading

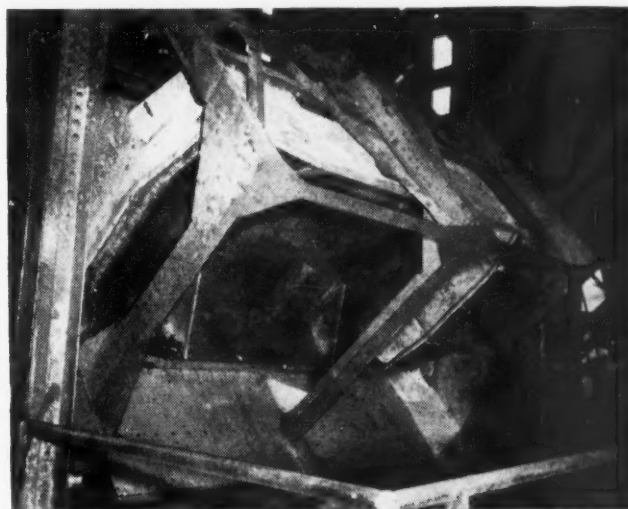
and hauling and would set the mine up for a capacity of 6,000 tons per three-shift day. Large mine cars were the first thought but a difficulty was the prohibitive expense and delay in enlarging the 312-ft. hoisting shaft.

F. E. Christopher conceived the idea of using a single cage double the size of the old ones and designing this single cage for side dumping of solid-body cars. This

idea, if it could be carried out, had the advantage of not requiring shaft enlargement. To test his theory, Mr. Christopher had built in the mine shop a scale model of the guides, cage, overturning arrangement and a mine car, all of which could be tried out by actual dumping of coal. It used 3/16-in. wire ropes and its hoist was driven by a small motor. This model, about 7 ft. high, was developed

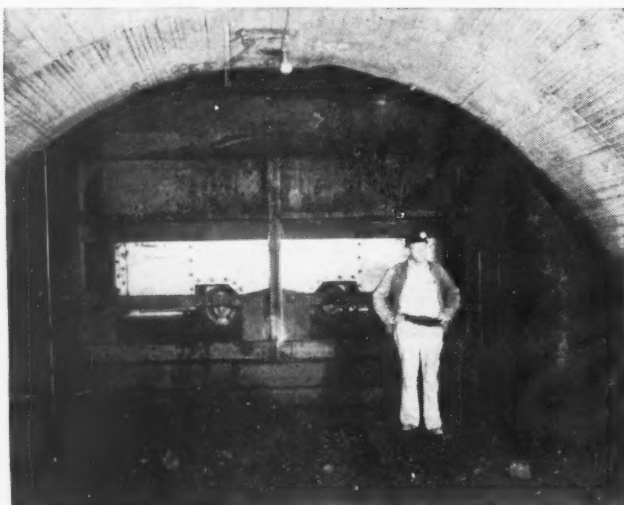


SIX TONS OF COAL pouring out as the aluminum-alloy cage dumps a mine car sideways at Christopher No. 6 mine.

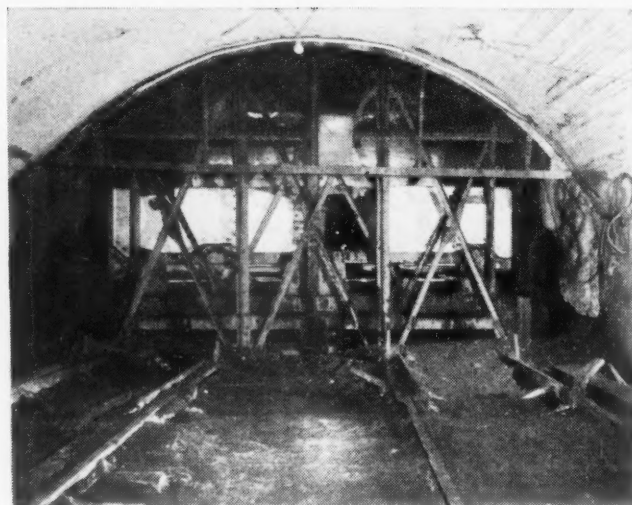


A 6-TON CAR in full dumping position. Cage weight is but 11 tons, compared to 18 tons for a comparable steel unit.

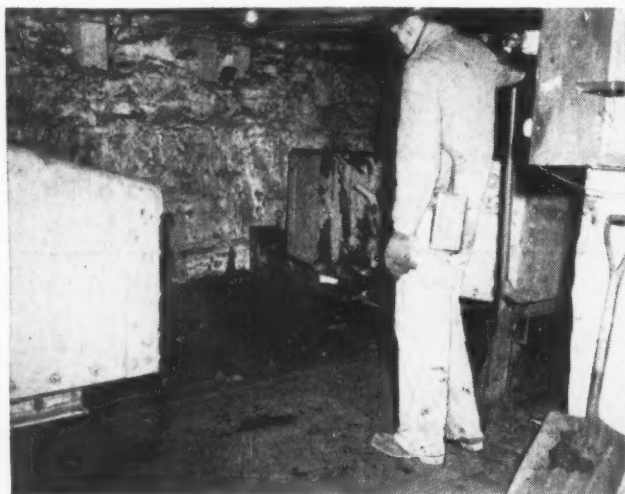
## OPERATION WITH SIDE-DUMPING CAGE AND BIG CARS



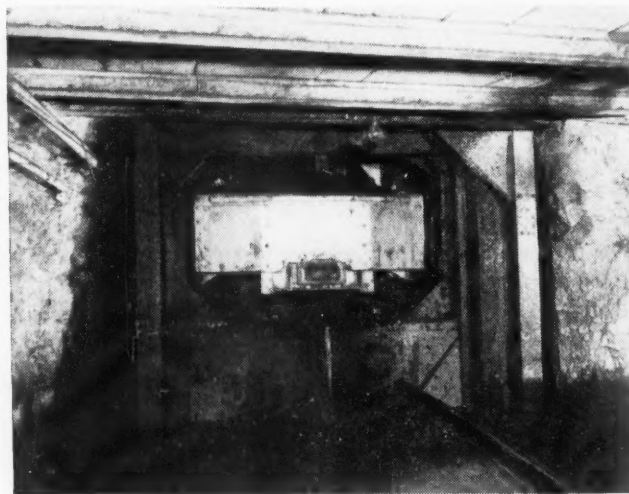
CAR ON THE NEW CAGE as seen from the empty side. Pat McCabe, superintendent, stands on one of the old empty tracks.



LOADED CAR pushing an empty off the new cage. This view was taken from the old loaded side of the hoisting shaft.



OPERATOR ON THE NEW LOADED SIDE operating the lever controlling the 16-ft. chain-type cager pushing the single car at the left onto the cage through the end of the hoisting shaft.



CAGE 2 FT. UP from the bottom after being belled off. Guides for the new cage are at the ends of the shaft. Cage runners therefore have gaps long enough to admit the cars.

and perfected until it operated with complete satisfaction.

The next step was to send the model to the Robt. Holmes factory, at Danville, Ill., asking proposals on a cage like the model but 8 ft. wide and 16 ft. 1 in. long. Built of steel, this side-dumping cage would weigh 18 tons; of duralumin, 11 tons. Duralumin was selected because it required a lighter counterweight and simplified the changes that would have to be made in the hoist. The Holmes company also was given the job of redesigning and building a drum for handling this single cage and counterweight. Calculations showed that the existing 400-hp. motor would be ample for the job.

The new drum, of single cylindrical-conical design, is double-grooved to accommodate two 1½-in. ropes suspending the cage and two more of the same size suspend-

ing the counterweight. Guides for the counterweight were installed in the curved end compartment of the shaft. The four new ropes, each 75 ft. long, are J. & L. plow-steel grade, used on the hoist before the change in drum design.

### Tipple Facilities Revised

The tipple, as it originally stood, had a tracked trestle from the headframe to the nearby hillside. This acted as a stiff leg. It was desirable to eliminate this trestle, so a stiff leg was added to the headframe to brace against vibration of the main shaker. At the dumping point up in the tipple a larger bin had to be built to accommodate the 6-ton loads of coal. It includes a fly-gate for diverting car loads of mine rock to a chute for disposal by motor truck.

Center buntons and attached

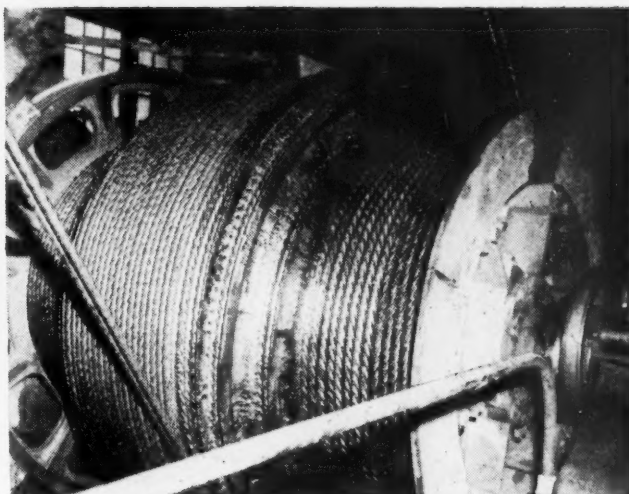
guides in the shaft were removed and new guides were installed at the ends of the double-sized compartment. As indicated by broken lines on the top of the shaft-bottom layout drawings, new chutes for loaded and empty tracks had to be driven to the ends of the shaft. These are only 14 ft. wide since they need accommodate but one track instead of two.

On the loaded side and close to the shaft, a motor-driven caging chain 16 ft. long was installed to push the loaded car onto the cage and shove the empty off. Its drive motor runs continuously and the mechanical connection is a reversible friction drive. By operation of one lever, the cager can start, stop or reverse the chain and can choose any speed. He can run the chain a full revolution to bring the dog back or can reverse the chain to accomplish the same thing.





LOOKING DOWN into the shaft from the surface. The new cage fills the space formerly occupied by two old cages.



THE OLD HOIST was fitted with a double-grooved cylindro-conical drum accommodating two cage and two counterweight ropes.



IN THE OFFICE at Christopher No. 6 mine—Pat McCabe (left), superintendent; Lee Christopher, operating vice president; F. E. Christopher, president.



UNDERGROUND OFFICE—Floyd Aliucci (left), mine foreman; Everett Lipps, safety director; Pat McCabe, superintendent; and James Crockett, chief company inspector.

Just outby this cager is a chain haul 30 ft. long which feeds the trip of loaded cars. It is started by the landing of the cage and is stopped by a limit switch after advancing the trip one car length. On the empty side is another 30-ft. chain which pushes the empty trip away in one-car-length steps. Two men operate the bottom and the one on the empty side does the belling.

The lower of the shaft-bottom drawings indicates the bottom haulage for the approach and exit from the shaft. Loads coming from Side "A" pull onto "B" and then are ushered around "C" to the empty track, "E." Loads coming from "B" side are pulled onto "A" and then are pushed around "F" to "E."

A total of 350 new 6-ton cars were installed to replace the 3-ton steel cars which had been used in

the interim. The new cars, made by the American Car & Foundry Co., are solid body, four-wheel, through-axle units with a rated level capacity of 230.3 cu.ft., or 6 tons of coal; tare weight, 3 tons; 16-in. wheels with Timken bearings; parking brakes on two wheels; over-all width, 7½ ft., over-all length, 15 ft. 8 in.; wheel-base, 50 in.; track gage, 44 in.; height above rail at front end, 45 in.; at read end, 39 in.; Ohio Brass couplers. Mechanically loaded, the cars have been averaging 6.2 tons of coal.

#### Capacity More Than Doubled

The new car and hoisting equipment, put into use in July, 1947, set the mine up for the 6,000-ton three-shift bogey. From the 2,500-ton capacity before this latest improvement, the mine has now been

raised to a peak of 4,500 tons per day. Car shortages, which limit operations to two to four days per week, are keeping the monthly tonnages down.

An airshaft 275 ft. deep has been sunk at an outlying point to serve as an intake for ventilation. The work of driving underground to make a connection to this new shaft is now nearing completion. Transportation equipment is being augmented by six new Jeffrey 8-ton cable-reel locomotives scheduled for early arrival.

Other executives and officials of the Christopher Mining Co. are Joseph S. Farland, executive vice president; I. L. Neville, secretary; and J. F. Stickel, purchasing agent. At Christopher No. 6 mine Pat McCabe is superintendent; Floyd Aliucci, mine foreman; and Ernest Phillips, maintenance foreman.

# Deepwells Put Underground



## Installing New Deepwell Pumps in the Mine Instead of on the Surface Cuts Investment Cost About Half

INSTALLING DEEPWELL pumping equipment underground instead of on the surface, as originally contemplated, cut the investment to about half at Lake Superior Nos. 3 and 4 mines, Lake Superior Coal Co., Superior, McDowell County, W. Va. The original plan would have involved drilling a borehole 350 ft. deep about 2,000 ft. away from the shaft. The one finally adopted was based on installing the pumping units underground over a shallow sump near the hoisting shaft and discharging through a column line in that shaft. The addition of two 2,300-g.p.m. turbine pumps to existing equipment provides a comfortable margin even in the wettest seasons and insures spare dewatering facilities if there is a pump breakdown or a power failure at a critical time.

The new underground pumping station is in No. 3 mine at a sump about 600 ft. from the bottom of the 250-ft. hoisting shaft. It handles all the water from that mine and also from No. 4 mine in a seam 65 ft. above. Mining is done in both

seams simultaneously and the workings are laid out so that entries in one seam are driven directly over or under those in the other. Pillar mining in the upper (No. 4) seam is kept 100 to 150 ft. ahead of that in the lower (No. 3) seam. Part of the water from No. 4 mine comes down into No. 3 through roof breaks and part is brought down the No. 3 hoisting shaft through a pipe. To tap the No. 4 level, this pipe extends horizontally through a seal, or barrier, near the shaft.

For a number of years two horizontal centrifugal pumps in the No. 3 mine, in the location where the new station has been installed, handled the water from the two mines. These old pumps have been incorporated into the new station to serve as spares. One is a 1,000-g.p.m. McGowan unit driven by a Westinghouse 125-hp. 2,300-volt motor, and the other a Goulds 300-g.p.m. machine with a General Electric 40-hp. 250-volt d.c. motor.

A few years ago the quantity of water increased rapidly. Since it was during the war period, coal-

company officials had an uncomfortable time waiting for new equipment. Two new Fairbanks-Morse-Pomona deepwell turbine pumps were purchased from the Ensign Electric Mfg. Co., Huntington, W. Va. The first was received and installed in 1945 and the second in 1946. These Type MC four-stage 16-in. water-lubricated pumps are rated at 2,300 g.p.m. at a 305-ft. total dynamic head. Motors are Westinghouse Type CS 2,300-volt 1,780-r.p.m. 200-hp. linestart units. Controls consist of Clark No. 6070 high-voltage across-the-line starters and Clark No. 3600 Form E float switches.

The existing underground pump-room, which was plagued with bad top, was enlarged to 30x30 ft., brick walls were built and the roof was supported with steel beams. The sump extends under part of the floor area of the station and is 13 ft. deep. The bottoms of the pump strainers are 11 ft. below floor level and the discharge at the top of the hoisting shaft is 258 ft. above the pumphouse floor.

To drain water from a swag near the hoisting shaft a ditch 4 ft. wide, 8 ft. deep and 200 ft. long has been excavated and concreted to the pumping station sump. That part of the water from No. 4 mine which comes down the No. 3 shaft is discharged into the swag and then runs through the ditch to the sump.

An existing 10-in. steel discharge line from the pumping station to the shaft and on up the shaft to the surface is being used for the new pumps. It is planned, however, to install an emergency discharge in the airshaft and also to bring an auxiliary 2,300-volt power circuit for the pumps down that shaft.

One Pomona pump alone is capable of handling all the water from both mines in the wettest season that has occurred to date. Since two were installed, one thus becomes a standby for the other. The two old centrifugals also are ready to be placed in service if more water enters than one pump can handle and the other is out of commission at the same time.

Operating officials like the deepwell turbine pumps because no priming equipment is necessary. Stopping and starting are completely automatic, thus saving labor, which has become such an important factor in mine cost and reliability.





## EXIDE-IRONCLAD POWER

assures full shift availability

**WHETHER** the motive power is for shuttle cars, locomotives or trammers, you can count on Exide-Ironclad Batteries for continuous, trouble-free performance all day long... and day after day.

The dependable performance of Exide-Ironclad Batteries is due largely to the construction of the positive plates, which differ from those of all other batteries. These plates consist of a series of slotted tubes which contain the active material. So fine are the slots that, while they permit easy access of the electrolyte, they prevent the active material from readily washing out. The results are longer plate life, higher power ability and better battery service.

For dependability, long life and ease of maintenance, choose safe, economical Exide-Ironclad Batteries. If you have a special battery problem, or wish more detailed information, write for booklet Form 1982.

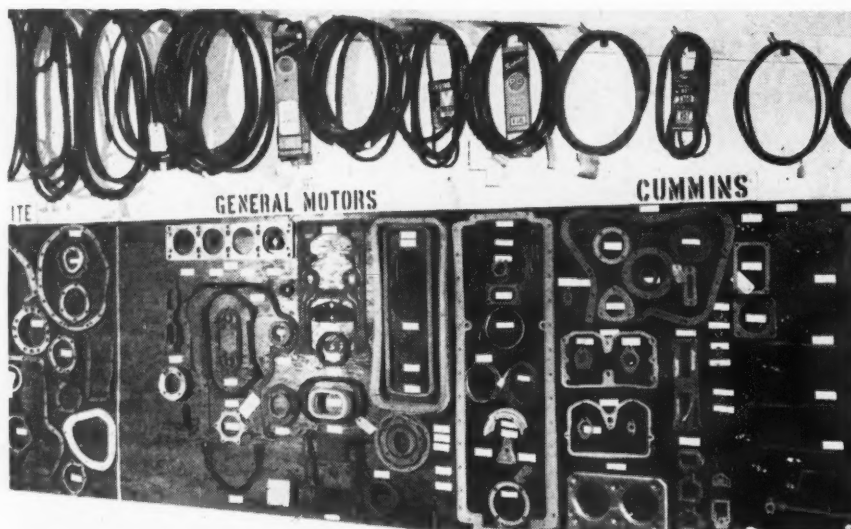
# SAFE POWER



THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia 32 • Exide Batteries of Canada, Limited, Toronto



# The Foremen's Forum



FAN BELTS AND V-BELTS graded to length on this sloping rack present a picture of good housekeeping. This arrangement speeds selection, saves space.

## System in Handling Supplies Speeds Storage, Protects Parts

GOOD HOUSEKEEPING pays dividends to any operation that will take the trouble to inaugurate a system and will insist on everyone observing the few simple rules necessary to its success. A good place to begin is with supplies, including all items for which the storekeeper is responsible—even items in the timber yard. Large inventories costing tens of thousands of dollars, often crowded into inadequate quarters, need to be taken care of systematically. Second to keeping an accurate filecard record is the need for arranging and protecting repair parts while in storage, remembering that it is important to be able to locate items quickly when it comes time to charge them out.

All renewal part items should be tagged. Identification tags should carry the manufacturer's name, the name of the renewal part and a catalog number. Tags should be durable and should be tied on the piece when it is lifted from the shipping crate. Using the catalog number is perhaps the safest way of identifying a part since mechanics have a way of redubbing parts with names of their own choice. Names get changed but numbers do not—at least not purposely.

Supply bins should be numbered according to some orderly plan. An incident at a newly constructed store-room at a large strip mine is a case

in point. The storekeeper, because of poor deliveries on steel bins, had had five sections of wooden bins built and was trying to decide on a labeling method. Each section was nine tiers high and 24 bins wide. The storekeeper asked for suggestions. "Why not," it was asked after several minutes of discussion, "call the first bin of the top row A-101, and the last one of that row A-124? Then dropping down, tier by tier, substitute for the first figure one in the numbers given, the number of the new row. Thus, the first bin of the bottom row would be 901, and the last bin of that row, 924. Similarly, the numbers of the other four sections would be preceded with the letters B, C, D or E." The storekeeper took the suggestion under consideration. Later, he reported that he had adopted it.

It seemed a simple and straightforward way of labeling the bins. One advantage to be foreseen was saving a night mechanic considerable time. Often, on the second and third shifts, the night mechanic or night watchman has to search for an odd supply item or two.

An orderly arrangement of items in the bins, so that one part can be removed with little or no disturbance to the others, helps to conserve time and to keep things orderly. The grouping of one manufacturer's parts is less confusing, for example, than storing

### How Are You on Keeping Supply Costs Down?

This quiz is designed to help you in your supervisory work. Study the questions, check "Yes" or "No" and then turn to p. 102 for explanation.

1. Have you ever made an inventory to find out what supply items you use? ..... Yes ☐ No ☐
2. Do you know which supply items represent the most in cost per ton? ..... Yes ☐ No ☐
3. Do you think it is not necessary to talk over cost of supplies and materials with your men? ..... Yes ☐ No ☐
4. Do you frequently find yourself without enough or more supplies on your hands than required for regular operation? .. Yes ☐ No ☐
5. Do you let the suppliers worry about finding a place for materials, parts and so on? ..... Yes ☐ No ☐
6. Do you check closely on the way your machines are handled and maintained? ..... Yes ☐ No ☐
7. Do you check to see whether material is being destroyed through misuse and carelessness? ..... Yes ☐ No ☐
8. Do you really know that no materials are being lost or left behind in moves? ..... Yes ☐ No ☐
9. Do you regularly recover materials and supplies from worked-out areas? ..... Yes ☐ No ☐

MINE LUBRICANTS

MARATHON

V.E.P. OIL



Different! Proved for 10 years!

## MARATHON V.E.P. OIL MAKES ENGINES LAST 50% LONGER

than they would with ordinary oil\*

There's no other oil like V.E.P. It's patented! It's the pioneer, heavy-duty additive oil! Put it in any engine, gasoline or Diesel, and you'll get 50% more work between overhauls. Even more important, Marathon V.E.P. makes engines last 50% longer than they would with ordinary oil, \*as proved in scientific tests and 10 years of job performance.

Marathon V.E.P. gives you everything you expect of the finest heavy-duty oil...plus these outstanding advantages:

- V.E.P.'s "Magnetic-like" film clings to vital engine parts, prevents damaging "dry" starts. "Stays put" at high temperatures. Protects bearings against corrosion.

- V.E.P.'s constant cleaning action keeps engines clean...valves and rings free...oil holes and lines open. Saves wear, saves fuel. Conserves power.

- V.E.P.'s triple-plus film strength gives more than 3 times as much protection as ordinary oil against heat, pressure, shock.

A COMPLETE LINE OF MARATHON LUBRICANTS FOR  
EVERY OPERATION IN YOUR STRIP OR SHAFT MINE



# THE OHIO OIL COMPANY

Producers of Petroleum since 1887

GENERAL OFFICES: FINDLAY, OHIO • District Offices: Robinson, Ill., Indianapolis, Ind., Louisville, Ky.

## What They Say About Foremen

If he's pleasant, he's too familiar; if he's sober-faced, he's a sourpuss.  
If he's young, he doesn't know anything; if he's old, he's an old stiff.  
If he's a lodge man, members expect favors; if he's not, he's not a "good guy."  
If he goes to church, he's a hypocrite; if he doesn't, he's a heathen.  
If he drinks, he's an old soak; if he doesn't, he's a tightwad.  
If he talks to everybody, he's a gossip; if he doesn't, he's stuck up.  
If he enforces the rules, he's too particular; if he doesn't, he's careless.  
If he looks around, he's a snooper; if he doesn't, he's not on his toes.  
If he tries to settle all complaints, he needs the wisdom of Solomon; if he worries about them, he'll soon go crazy.  
He needs the patience of Job, the skin of a rhinoceros, the cunning of a fox, the courage of a lion.  
He must be blind as a bat, silent as the Sphinx.  
*Are there any good foremen?*  
*Yes, plenty of them, and they're not all in the cemetery.*

—Adapted from *Four Wing News*, Island Creek Coal Co.

all manufacturers' controller fingers and drum segments together. For one with a part in hand to be matched, the latter arrangement would complicate matters all the more.

The answer to keeping bins clean, for some storekeepers at least, has been the use of the 1-hp. universal-motor-equipped portable mill-type blower. Used as a vacuum cleaner, all the dirt and dust is collected in a bag. As a blower, it is a handy instrument in electrical maintenance work for periodically blowing dust off motor windings and switchboards. While the pressure (about 25 lb. per square inch) is sufficient to remove the dust, it is not strong enough to damage the equipment's insulation. Another advantage of the blower, compared to using compressed air, is that the risk of driving moisture into the insulation is not involved.

### Rag Supply Helpful

As the storeroom clerk is closely associated with maintenance work, he can help promote more efficient maintenance by carrying a plentiful supply of clean cotton rags. Cotton rags are preferred over cotton waste for wiping off a ball- or roller-bearing assembly. Rags are easier to issue and perhaps more economical to use. One method of dispensing them would be in 1- or 2-lb. tightly-rolled balls given to each mechanic at the start of his shift on Monday. When the mechanic puts on clean work clothes, it usually is at the beginning of the week. This is a good time for him to go to the storeroom and pick up his week's supply of clean cotton rags.

Packing supply items for shipment to underground storerooms and shops is as important as any other phase of the main storeroom job. Expensive bearings, machined parts and fragile pieces often ride in the same car with tools sharpened by the blacksmith, bits, etc.—and the storeroom parts

may be on the bottom of the pile. Therefore, it pays to go to considerable trouble to protect and separate the renewal-part items from the run-of-shop items in the material car because they all are subjected to considerable bumping around before they reach their destination.

### Cleanliness Pays

In the underground shop, much will be accomplished in the way of good housekeeping if motor pits and benches are kept clean. It may not be feasible to clean the pit at the end of each shift but bench tops can stand cleaning that often. Motor pits do not make ideal cuspidors because eventually mechanics have to get in them to work. Besides, it is hard enough to keep pits dry enough for safe footing.

Oil-soaked rags around the shop are a hazard and should be sent on top for burning. Fire may result from spontaneous combustion if oil-soaked rags are kept in badly ventilated places. In 1945, for example, 354 men were killed in a Chilean copper mine when fire started in a pile of oil-soaked waste in an underground car-repair shop.

### Cutting Supply Cost

"Yes" should be the answers to all but Questions 3 and 5, p. 100. The reasons are:

1. Any economy program must start with a knowledge of what things are used and how many of each. Materials and supplies represent nearly 15 percent of the cost of producing bituminous coal and nearly 10 percent of the cost of anthracite. Coal mining uses a surprisingly large number of items. Making out a list of things is a good way of starting on an economy program.

2. To cut cost in anything, the best

place to start is with the item or items representing the greatest investment. One machine part, for example, may cost several hundred dollars. On the other hand, a post might cost less than a dollar but, since a lot are used, the total investment would be considerable. Obviously, therefore, the first step in cutting supply cost is to find out which items bulk the largest in dollars.

3. As with practically everything else, the supervisor must depend on his men for the major help in keeping supply cost down. If they know something involves a lot of money, they are more likely to treat it with respect. A little judicious conversation on costs and on methods of saving materials cannot help but create greater interest in more economical use.

4. An oversupply of material lying idle in a section means that extra money is being tied up uselessly. On the other hand, running out of a critical item may stop the flow of coal and run cost way up. The answer is a careful study of needs and careful scheduling of requisitions to make sure that the right quantities of the right things are at the right place at the right time.

5. A good way to insure that material is lost or destroyed is to let it be dumped anywhere and left out in the open without protection. The supervisor should prepare special depots for receiving materials and supplies and should make sure that racks, cabinets and the like are provided for protecting items that should not be left exposed.

6. Bad handling of machines and poor maintenance, including failure to lubricate properly, and bad power, result in increased breakdowns, requiring more parts and material for repairs. The answer is obvious.

7. When a man cuts a post too short and has to throw it away, the cost of coal goes up. The same is true of a lot of other items. Men should be educated to treat materials and parts with proper respect and to exercise care in their use.

8. A steel tie pitched into the gob or a number of posts left behind in a move mean an actual money loss and a higher production cost. Careful checking to make sure everything that goes into a section and is not used up comes out for use in the next place, and training of men in handling of materials and parts, are some of the answers.

9. Salvage, as long as it can be done safely and at a cost less than the cost of purchasing new material, is a major method of keeping supply cost down. Real economy in the use of supplies cannot be claimed unless there is a well-thought-out program for the recovery of timber, rails, worn machine parts and so on. Even if a part or item cannot be used again, it may have a good scrap value, especially if it is copper, steel or some of the other more expensive metals.



# UNITED STATES RUBBER COMPANY

SERVING THROUGH SCIENCE

## THE NEW U.S. Conveyor Belt 2½ TO 4 TIMES STRONGER!

### Permits Higher Tensions, Longer Hauls, Higher Lifts and Greater Tonnages

By combining two famous textiles—Ustex\* and nylon—scientists of United States Rubber Company have created a new conveyor belt with these exceptional characteristics:

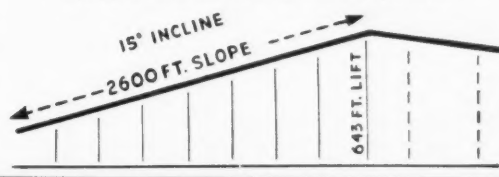
- 2½ to 4 times stronger than the strongest duck-and-rubber conveyor belt ever produced—made possible with the world's strongest cotton yarn—Ustex—another U. S. Rubber development—
- Greater troughability—due to use of flexible nylon—
- Possible to repair quickly in case of accident—with the same equipment and same techniques already known to maintenance men—
- Economical to operate—due to longer centers—fewer transfer points—
- Less than one-half the weight of a conventional duck-and-rubber belt of equivalent strength.

This new "U. S." Belt was designed especially for those extra big conveyor jobs, involving high tensions, longest possible center distances, high lifts and capacity tonnages.

Maybe this new Engineered Rubber Belt will help you solve a difficult material-handling problem. Write to Mechanical Goods Division, United States Rubber Company, Rockefeller Center, New York 20, N. Y.

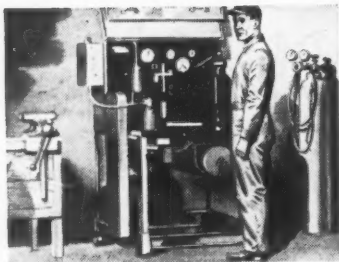
\*Ustex—Registered Trade Name of United States Rubber Company

Longest single-belt coal slope conveyor in the world—  
equipped with the new U. S. Conveyor Belt.



Interesting story of this installation told in brochure available on request. Ask for M-7848.





# Operating Ideas



ROOF SUPPORT by paired crossbars and twin pins provides clearance for loading machine. Advance is simplified.

## Four Pins, Two Ties Support Twin Crossbars

USE OF PINS to support timbering above loading machines at the face has been effectively adapted in Federal No. 1 mine, Coal Division, Eastern Gas & Fuel Associates, Grant Town, W. Va. As shown in the accompanying photograph, snapped in a working place, a mine tie is laid across from one steel pin to the next and two crossbars then are wedged into place above the tie. The same procedure is followed at the opposite end of each pair of crossbars. In this way, a pair of crossbars, four pins and two ties make up a roof-support unit and it becomes easy, when a new cut

is made, to remove the outby unit and re-erect it at the face. In each working place, six crossbars, or three units, are used.

Holes for the steel pins are drilled by the regular drilling crew, using coal drills and special short augers. Holes are 2 to 3 in. in diameter and 18 in. deep. Pins are made from whatever suitable steel is at hand. Some pins, for example, are 36-in. lengths of 2-in. round steel and others are pieces of 30-lb. scrap rail with one end forged to round. The Pittsburgh No. 8 seam in the Federal No. 1 mine is 78 in. thick. Ten inches of top

coal is left to protect the 3 to 4 ft. of frail and irregular bone, wild coal and drawslate.

This adaptation is one of several face-timbering methods that use pin support in the Pittsburgh No. 8 seam. In some mines, the pins are placed close to the roof (*Coal Age*, December, 1946, p. 140) and in others about midway the seam, with screw jacks between the pin and the crossbar (*Coal Age*, January, 1947, p. 64). Another variation is to support individual crossbars on individual pins. Pin timbering at the face has been widely applied in this area in recent years.

For permanent or temporary trackage

*there's a U-S-S American Rail Bond*



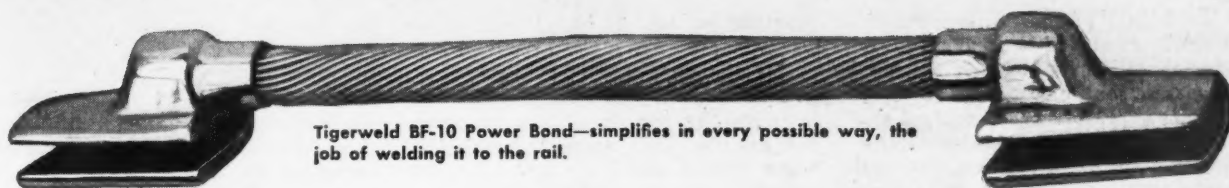
**I**F you need rail bonds that permit quick, easy installation on permanent trackage, we suggest BF-10 TIGERWELD Rail Bonds. They have a self-clamping feature that holds the bond in the correct position for easy welding.

For temporary or other trackage where welded bonds are not necessary, the American Wedge Type Bond can be installed or removed in a few minutes.

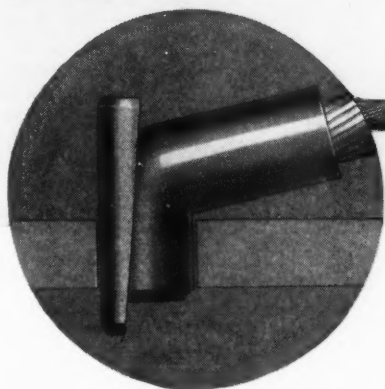
There's a place in most mines for both of these sturdy bonds. They have high resistance to vibratory stresses, maintain constant low voltage and reduce power losses.

Installation crews like these bonds because they can install more per day. Engineers prefer them because they stay put and keep power flowing year in and year out.

For complete information on all types of U-S-S TIGERWELD Rail Bonds, contact our sales office near you.



Tigerweld BF-10 Power Bond—simplifies in every possible way, the job of welding it to the rail.



U-S-S American Wedge Type bond—offers the easiest installation—yet holds with a tight grip. A hammer is the only tool required for installation of these bonds.

### American Steel & Wire Company

Cleveland, Chicago and New York

Columbia Steel Company, San Francisco, Pacific Coast Distributors  
Tennessee Coal, Iron & Railroad Co., Birmingham, Southern Distributors  
United States Steel Export Co., New York

**UNITED STATES STEEL**

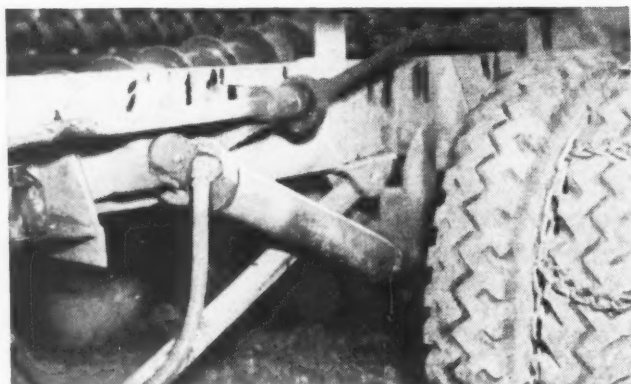


# U-S-S American Rail Bonds





HOME-MADE drill is completely mechanized, with self-propulsion, hydraulic auger lift and variable speed control.



TWO HYDRAULIC jacks like this one can raise the auger as much as 19 in. to meet various conditions of drilling.



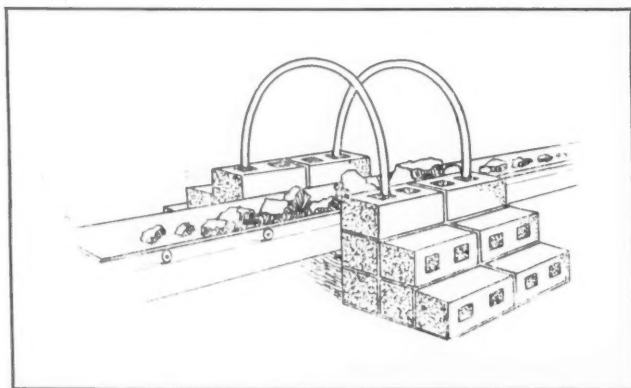
C. A. LEE, SUPT. (left), and J. H. Clouse, chief electrician. Variable-speed control wheel is directly below Mr. Lee's right hand.

## Shop-Built Horizontal Drill Is Self-Propelled

A HORIZONTAL DRILL for high-wall work, complete with a hydraulic lift for the auger, a steering mechanism, driver's seat, chain drive for self-propulsion, variable speed control and braces to prevent backward creeping, has been built in the mine shop and put into service at the Marigold strip mine of the Marigold Coal Mining Co., Jasper, Ala. The drill, built on a 1½-ton Chevrolet chassis and rear end, is shown in the accompanying

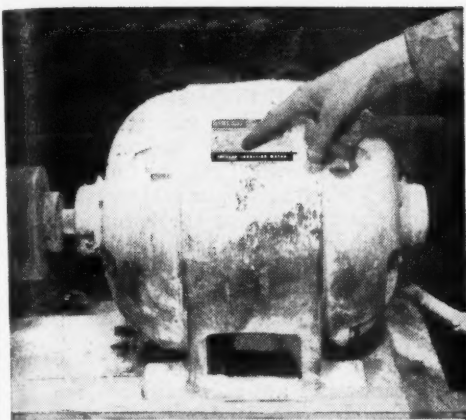
illustrations. A 15-hp. V-belt drive from the motor to a Ford transmission drives the augers, which are governed by a Reeves variable-speed control providing speeds from 6 in. to 28 ft. per minute. This same transmission, when moved along its track to the highwall end of the drill, can be connected by a pin to a chain drive for propelling the drill to the next drilling place. A pair of 3-in. steel pipes about 6 ft. long, pivoted from

the rear-end axle and provided with 4x6-in. steel plates at right angles to the auger axis, slant downward and, lying against shallow depressions dug out for the purpose, brace the drill and prevent its creeping away as the auger drives into the highwall. Hydraulic jacks on each side of the drill near the highwall end, shown in the close-up illustration, are operated with a handle to raise the auger as much as 19 in.



## Bridge Makes Crossing Safer

THE SIMPLE BRIDGE shown in the accompanying illustration and described in *Colliery Engineering*, July, 1947, makes it safer for a man to cross over a fast-moving conveyor belt when clearances don't permit erection of an ordinary bridge. The structure consists of concrete blocks built up to necessary clearance height. Curved pipes, grouted into the casting holes, serve as handrails and enable a man to vault across the conveyor without danger. Steps can be provided as needed by using more blocks. Bridges like the one shown are in use at the Kiverton Park colliery, England.



Keeps Its Bearings in "Dust Bowl"

Ordinarily, we wouldn't recommend that you use an open motor on a job like this. This Tri-Clad motor drives a boiler-feed pump in the National Gypsum Company plant at Clarence Center, N. Y. The air surrounding the motor is constantly filled with gypsum dust which must be kept out of the bearings. And it *has* been kept out of the bearings of this Tri-Clad motor, thanks to its specially designed bearing housing and seals. We believe that the Tri-Clad motor you see here proves that even where dust, moisture, or some other hazard is extremely severe for open-motor applications, the extra protection afforded by Tri-Clad motor construction results in longer motor life and lower upkeep.

**The toughest motor yet!**

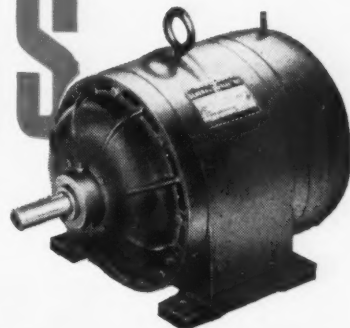
The Tri-Clad totally enclosed, fan-cooled motor is designed for use in adverse atmospheres — in iron dust, out of doors, in hazardous areas, and chemical atmospheres. It gives you these important construction features:

- A cast-iron, double-wall frame which completely encloses and protects the windings and punchings.
- A nonshrinking compound around motor leads which protects motor interior from dust and moisture.
- A rotating labyrinth seal which further protects the motor interior from damage by foreign matter.



**TRI CLAD**  
REG. U.S. PAT. OFF.  
**MOTORS**

# ON 1,220,000 MOTORS



## TRI CLAD

THE SYMBOL OF

# EXTRA PROTECTION

Announcement of the Tri-Clad motor, back in 1940, ushered in a new concept of general-purpose motor design. Substantially increased horsepower-per-frame-size was one feature. Smarter appearance was another. But what really sold more than a million Tri-Clad motors is the *extra protection* we built into them.

Today, with the "family" including dripproof motors, vertical motors, gear-motors, capacitor-motors, and totally enclosed motors, Tri-Clad motor is, more than ever, the motor that means basic protection, dependable performance, and minimum upkeep. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

**EXTRA PROTECTION ... AGAINST PHYSICAL DAMAGE!**

Rigid cast-iron frame and end shields protect vital parts from external abuse and prevent resonance. Because they're not at the mercy of a coat of paint, they strongly resist chemical attack and dampness. Cast iron also gives you tight, *metal-to-metal* fits between end shields and frame.

**EXTRA PROTECTION ... AGAINST ELECTRICAL BREAKDOWN**

Windings of Formex\* wire together with improved insulating materials, reduce the chances of electrical failure. Heat is dissipated quickly — motor stays young for years and years.

**EXTRA PROTECTION ... AGAINST OPERATING WEAR AND TEAR!**

Bearing design affords longer life, greater capacity, improved lubrication features. Bearing seals retain lubricant, keep out dirt. One-piece, cast-aluminum rotor is practically indestructible.

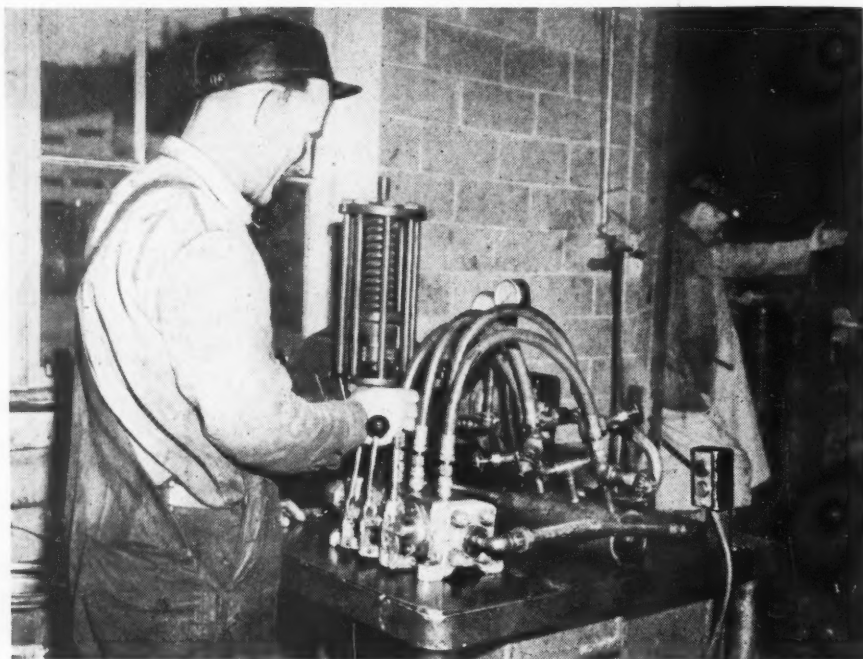
\*Trade-mark reg. U. S. Pat. Off.

**GENERAL  ELECTRIC**

156—2540



## Hydraulic Test Bench Serves New Shop



HYDRAULIC TEST BENCH checks condition of pumps and hydraulic control stations of loading machines.

A MACHINE FOR testing hydraulic equipment is an important item in the new shop of Crichton No. 4 mine, Johnstown Coal & Coke Co., Nettie, W. Va. The machine, shown with the operator in the accompanying photograph, was built in the mine shop and is especially adapted to testing pumps and hydraulic control stations of 12BU loading machines.

A 5-hp. motor, seen on top of the bench at the left, drives the pump. Oil reservoirs are of welded construction and are mounted under the bench. Reconditioned pumps are tested at 1,200 lb. per square inch and hydraulic control stations at 1,000 lb. per square inch. On the table is a meter for oil flow but it is seldom used for routine testing. If proper pressure continues after the pump has been operated long enough to heat the oil, the equipment is in good condition.

Maintenance of the control stations involves honing out the blocks, grinding the plungers to reduced size, building them up with bronze, then machining and polishing.

## Automatic Signal Indicates Fan Breakdown

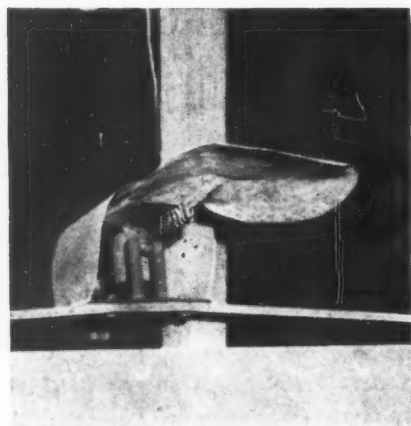


FIG. 1. AIR BLAST from exhaust fan supports the paddle and keeps the fan-alarm circuit open.

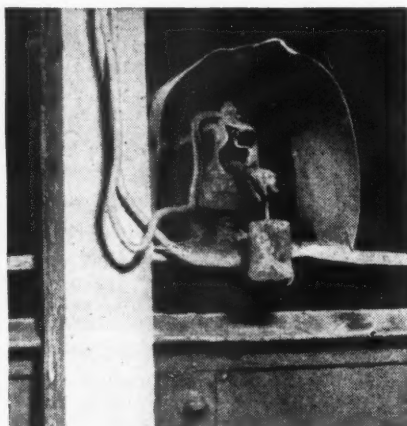


FIG. 2. FAILURE of air blast lets the paddle fall and sends this counterweighted end upward, closing circuit for fan alarm.

FAILURE OF THE MINE FAN is signaled automatically by a light-and-bell system at the Marion mine, Black Diamond Coal Mining Co., Marion, Tenn. A rocker arrangement with a horizontal paddle at one end, shown in Fig. 1, and a counterweight at the other end, shown in Fig. 2, is mounted above the fan exhaust so that the paddle is held aloft by the force of the vertical air column ejected by the fan. If the air blast diminishes or stops altogether, the paddle falls and the counterweighted half of the rocker shaft rises, closing the alarm circuit by touching a contact point that is mounted above. The closed circuit immediately flashes a light and sounds an alarm bell in the shop near the chief electrician's office. The contact surfaces are partially protected from weather by a metal hood shown in the accompanying illustrations.

The alarm panel in the shop, shown in Fig. 3, has the following component parts, reading from left to right: the bell, with a 220-24 volt transformer beneath; a Wadsworth switch that controls the bell; the fan contactor; the circuit-breaker contactor; the generator signal light, which burns as long as the generator is working, with its control switch below; and the fan warning light, with its control switch below.

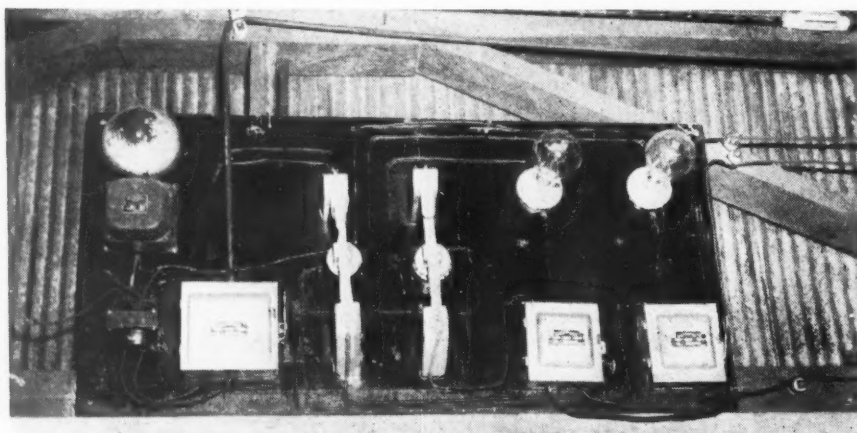


FIG. 3. ALARM PANEL in the mine shop is provided with bell, light, contactors, switches and transformer.





## Thor SINKER ROCK DRILLS

*SOME BLOW!* Thor Sinker Rock Drills excel in hole-cleaning capacity—and here's why: "straight-line" design delivers controlled air straight through the heart of the tool at full pressure. Teamed up with a harder hammer blow, "straight-line" design means faster penetration, more footage per shift. Prove this to yourself on your own jobs. Call your Thor dealer for a demonstration.

### INDEPENDENT PNEUMATIC TOOL CO.

600 W. Jackson Blvd., Chicago 6, Ill.

Birmingham	Boston	Buffalo	Cincinnati	Cleveland	Denver	Detroit	Houston
Los Angeles	Milwaukee	New York	Philadelphia	Pittsburgh	St. Louis	St. Paul	
Salt Lake City	San Francisco	Toronto, Canada			London, England		

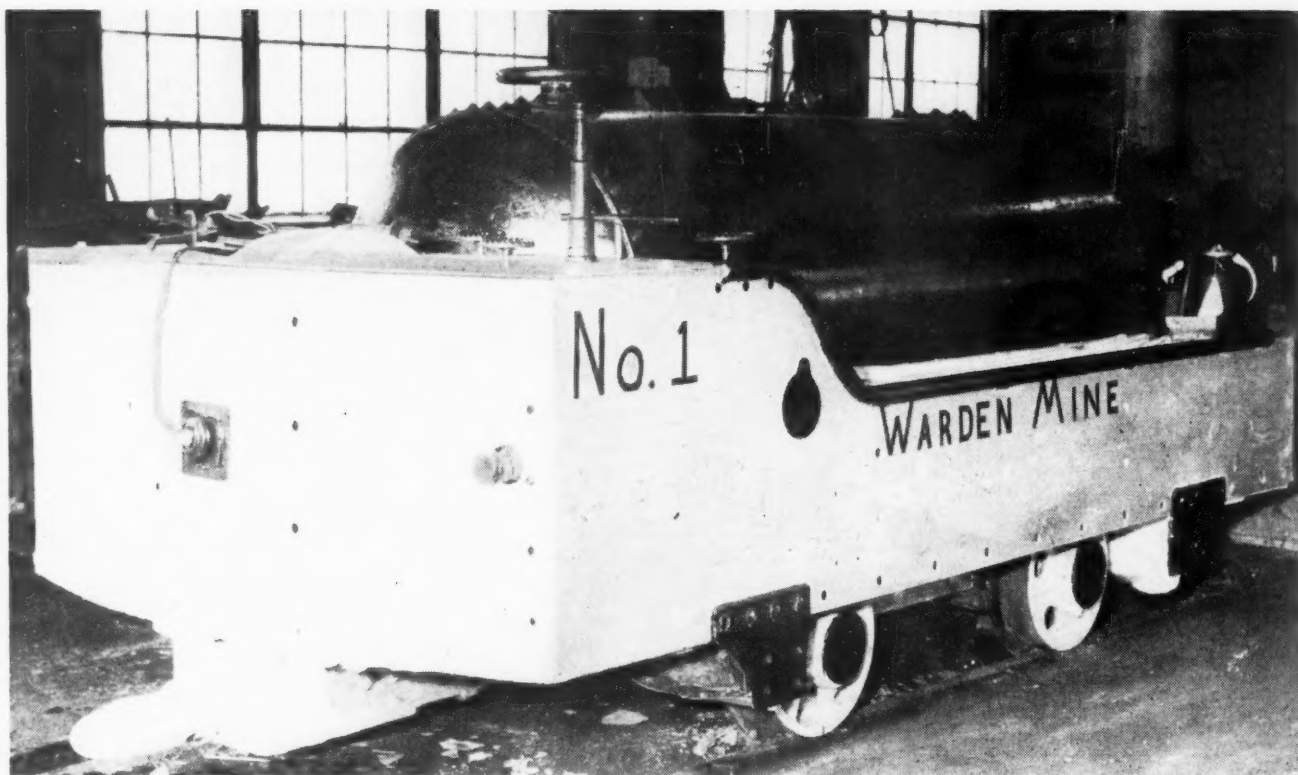


Thor Sinker Rock Drill  
(Model 75—Heavy Duty)

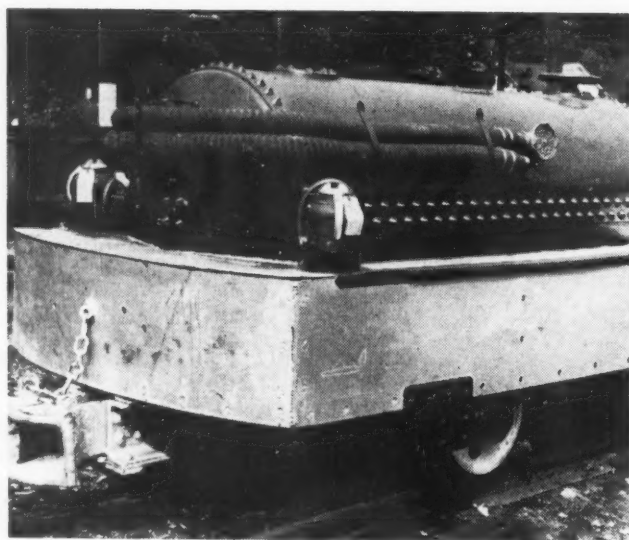
# Thor

PORTABLE POWER

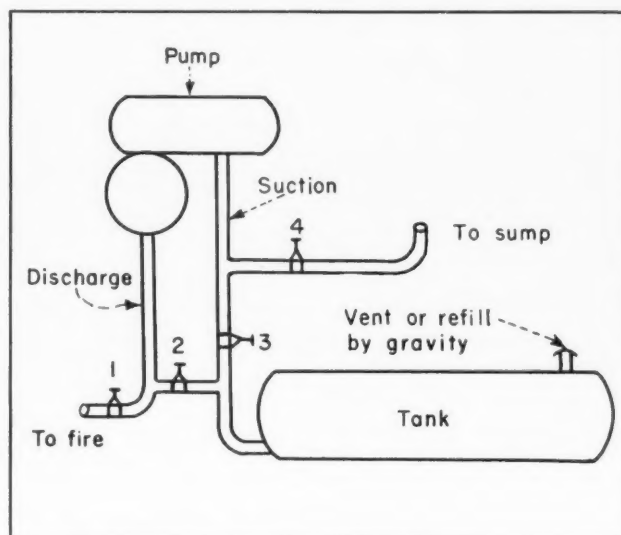
# TOOLS



MINE FIRE CAR can fight flames 460 ft. from a power source. Nozzle is at center, just above lettering, "No. 1."



PORTABLE EXTINGUISHERS are carried at the rear of the car. Fire-fighting tools are stowed in closed rear compartment.



FOUR VALVES and a pump provide control and pressure for fighting fires and refilling tank. Water can be pumped from nearby ditch.

## Fire Car Fights Mine Fires at Long Range

A MINE FIRE up to 460 ft. away from a power source can be fought with a fire car recently built by remodeling a standard mine car at the Warden mine, Pittsburgh Coal Co., Library, Pa. This effective range is provided by 300 ft. of 1½-in. fire hose, 100 ft. of No. 10, 2-conductor cable and 60 ft. of pressure. The cable is mounted on an automatic self-winding reel and the hose is carried in the car. Water is stored in a 500-gal. tank. In addition, two Douglas

fire extinguishers are carried at the rear of the car, seen in the accompanying illustrations. The car was built in the Warden shop, under the direction of Clyde Rugh, master mechanic.

Pressure is supplied by a No. 10 Labour pump, which pumps from the tank through No. 3 and No. 1 valves, as shown in the accompanying drawing. If water is available from a sump or ditch near the fire, the tank can be cut out and water pumped directly

from sump to fire by closing No. 2 and No. 3 valves and opening No. 4 and No. 1 valves. To refill the tank, the operator closes No. 1 and No. 3 valves and opens No. 2 and No. 4 valves. Twenty-five feet of 2-in. suction hose is used to refill the tank from any available water source.

At the rear of the car, just behind the fire extinguishers, is a compartment for fire-fighting tools such as axes, saws, wedges, bars and pipe fittings.



# LIGHT

## for Safety and Production

*Install* **EDISON** ELECTRIC  
CAP LAMPS  
for safe, effective light at the working point!

**EDISON** ELECTRIC  
CAP LAMPS

**M·S·A** COMFO CAPS

Details count . . . in mining, and in top mining equipment. The flood of brilliant light furnished by the Edison Electric Cap Lamp throws into bold relief every detail of the miner's job—for increased working safety and better efficiency. And in the Edison Lamp itself, the details of engineering, materials and construction stand out clearly in terms of unparalleled mining service. Let us show you how Light together with Comfo Cap head protection benefits every man in the mine.



**MINE SAFETY APPLIANCES COMPANY**

BRADDOCK, THOMAS AND MEADE STREETS . . . . . PITTSBURGH 8, PA.

*District Representatives in Principal Cities*

*In Canada*

MINE SAFETY APPLIANCES COMPANY OF CANADA LIMITED

TORONTO . . . MONTREAL . . . CALGARY . . . WINNIPEG . . . VANCOUVER . . . NEW GLASGOW, N. S.

SOUTH AMERICAN HEADQUARTERS

Casilla 733, Lima . . Agents in Principal Cities

MINE SAFETY APPLIANCES CO. (S.A.) (PTY) LTD.

Johannesburg, South Africa N'Dola—Northern Rhodesia





**REAR-DUMP TRUCK** extends its own rock pile and replaces rail car formerly used on abandoned refuse pile. A single truck driver replaces three men formerly needed on the pile, as well as six men working one day every two weeks to extend the rail.



**PUSHBUTTON CONTROL** of washer-refuse gates is provided for the driver, who spots his truck by watching rubber strip.

## Truck Replaces Rail Car for Rock Haulage

A 15-TON REAR-DUMP diesel-powered Euclid truck has replaced a rail car and tracks formerly used to haul rock and slate from the washer to the refuse pile at Flat Top mine, Sloss-Sheffield Steel & Iron Co., Flat Top, Ala. In an accompanying illustration the truck is seen dumping washer refuse over the edge of the new rock pile while the old refuse pile in the right background smokes and burns.

Advantages of the new rock-haulage system are said to be as follows: (1) the truck, by dumping from the rear, extends its own refuse pile, whereas a six-man detail formerly was required one day out of every two weeks to extend the old rail system; (2) a single truck driver

has replaced the three men formerly used full time on the old refuse pile and, because he moves back and forth between the washer and the rock pile, he escapes much of the heat, smoke and fumes given off by the burning refuse.

At the washer, the truck driver controls the refuse storage-bin gates by means of a convenient pushbutton switch panel that extends directly over the cab and within easy reach when the truck is spotted, as shown in an accompanying illustration. Rubber sheeting protects the switch panel from weather and, dropping down vertically even with, but outside, the cab, provides a marker for the driver to spot his truck by as he pulls up for loading.



## Fuses Protect Telephones

TWO, ONE-AMP. FUSES are used to protect each mine phone, reports Frank Eubanks, superintendent of maintenance, Old Ben Coal Corp., West Frankfort, Ill.

The fuses, shown in the accompanying illustration, are in an accessible place above the telephone. Should the telephone circuits accidentally come in contact with the 275-volt d.c. power system the fuses will isolate the phone and thus protect the delicate coils and contacts in the instrument.

In addition to the fuse protection, each telephone is recessed in the rib to give it as much physical protection as possible. After the No. 8 Mine explosion in July, the telephones, which also are fused and recessed in the rib, were found to be intact.

Likewise, at the new No. 9 Mine, all 1,000-amp. feeder switches are secured to steel frames that also are mounted in recesses in the rib. This permits each switch to be in a protected location and yet the position of the switch handle is clearly visible. Another advantage of this type of mounting, and one that is a safety improvement, is that it is necessary for someone to get off the trip or locomotive to open or close the feeder switches. No longer can they attempt to do it from the trip and on the fly.

**TELEPHONE IS** recessed in the rib and protected by two one-amp. fuses that are easily accessible above the phone.

## "MINE CAR OPERATION STEPPED UP"



**...with Tycol mine car greases"**



**Boston • Charlotte, N. C.  
Chicago • Detroit  
Pittsburgh • Philadelphia  
Tulsa**



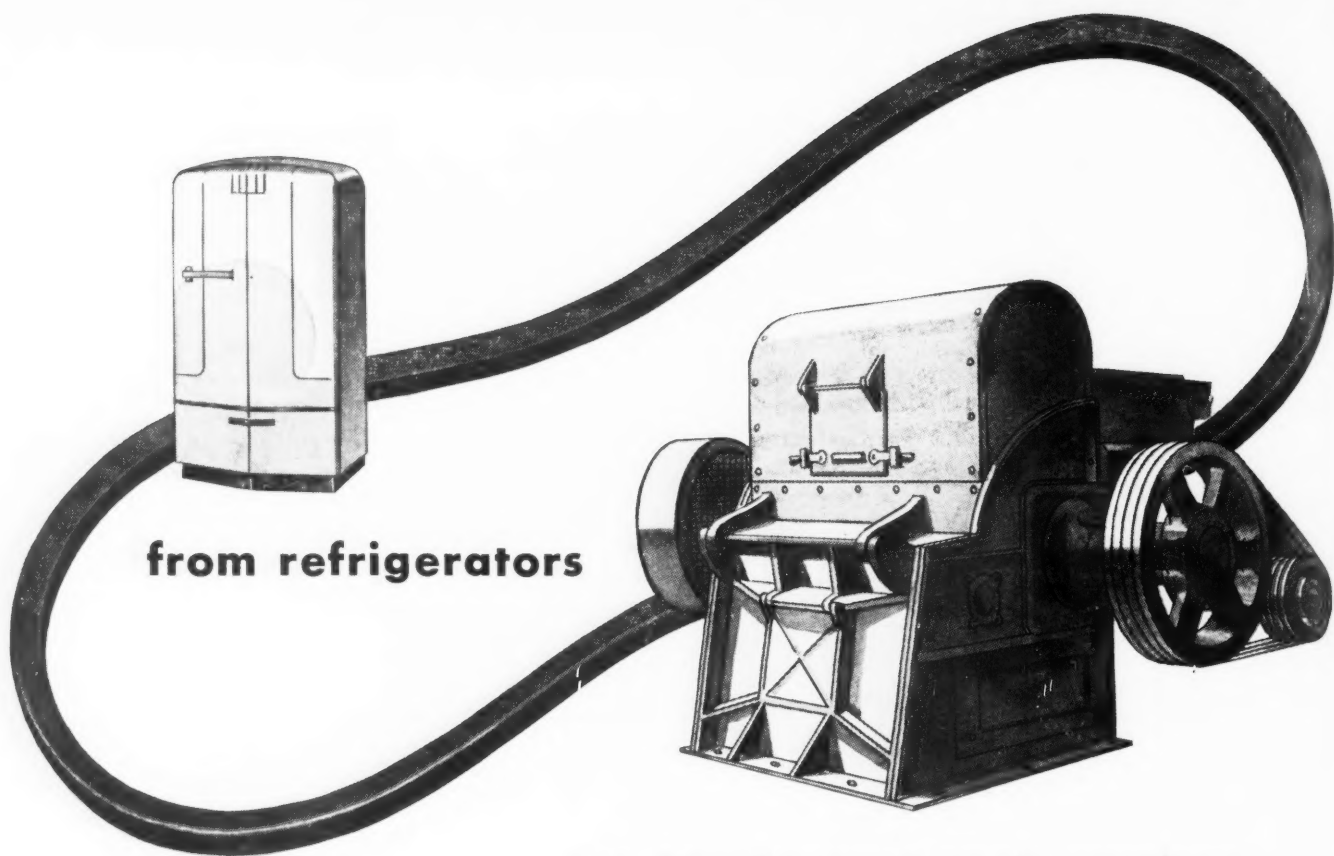
***"Life of bearings prolonged . . .  
Power requirements slashed . . .  
Less lubricant needed . . .  
Production accelerated . . .  
Operating costs lowered . . ."***

Like mining engineers everywhere, you, too, will find that the *new* Tycol Mine Car Greases are ex-

pressly engineered for more efficient mine car operation . . . in or out of the mine . . . under all weather conditions.

For details concerning the full benefits of Tycol Mine Car Greases, call your nearest Tide Water Associated Office today.

**LUBRICATION—"ENGINEERED TO FIT THE JOB"**



**from refrigerators**

**to the largest rock crushers . . .**

## **Thermoid** *V-Belts are on the Job*

**P**ower transmission engineers know the many advantages of V-Belt drives . . . compact, noiseless, positive, economical, etc. Experience has proven that additional advantages are derived—at no increase in cost—when Thermoid V-Belts are on the job.

Great strength, long life and uniformity are all built into Thermoid F.H.P. (Fractional Horsepower) and Multiple V-Belts, because every belt—from raw materials to finished product—is manufactured under the most exacting controls.

### **Your Thermoid Distributor Can Promptly Supply The Belts You Need**

The Thermoid Line Includes: Industrial Brake Linings and Friction Products • Transmission Belting • F.H.P. and Multiple V-Belts • Conveyor Belting • Elevator Belting • Wrapped and Molded Hose • Custom Molded Parts

A postcard or letter to the home office will bring his name and address to you.

Manufacturers of new equipment are invited to correspond direct with the home office.

# **Thermoid**

**Thermoid Company • Trenton, N.J., U. S. A.**  
Automotive • Industrial • Oil Field • Textile Products

**It's Good Business To Do Business With Thermoid**



# News Round-Up



## NLRB Ends Action Against U.M.W.A.

Withdrawal of its injunction proceedings against the U.M.W.A. and its agents in Kentucky, brought in the Kentucky Western Federal District Court at Owensboro, was reportedly requested by the NLRB last month. The complaint stemmed from the alleged interference by union members with the construction by the Jackson Construction Co. of a tippie and other facilities for the Sentry Coal Mining Co., after Sentry had reportedly refused to recognize the union as bargaining agent for employees who were to be hired at the new mine (*Coal Age*, November, p. 128).

It was understood that the NLRB action for withdrawal of the injunction suit was requested by the Jackson Construction Co., following termination of its contract with the Sentry Coal Mining Co.

Purchase of the Sentry property by the Ken Coal Co. also was reported and according to J. Ed. Morgan, president, District 23, U.M.W.A., Ken Coal had signed a contract with the union covering operation of the mine. Continuance of Sentry's damage suit against the union (*Coal Age*, October, p. 132) was expected, according to company sources. In the suit filed Aug. 21, Sentry asked for \$125,000 damages.

## Bituminous Miners Hit All-Time Wage High

The average weekly earnings of bituminous coal miners reached the all-time high of \$71.49 in August, 1947, according to the U. S. Bureau of Labor Statistics. Not only was this figure an all-time high for bituminous miners, it was the highest average weekly earning figure ever reported by the Bureau for workers in an entire industry. The miners worked an average of 40.1 hours a week in August and the average hourly rate was \$1.78, also a record high.

In comparison with the group's 1935-39 prewar average weekly earnings, according to a study by the Bituminous Coal Institute, August earnings were 223 percent greater and far greater than the increase for any other principal industrial group covered by the Institute's tabulation. Earnings of automobile workers in August, for example, were 84 percent

## Featured in This Section

New Developments .....	p. 115
Business and Coal Activity.....	p. 118
Personal Notes .....	p. 120
Coal Men on the Job.....	p. 123
Obituary .....	p. 126
Association Activities .....	p. 126
Illinois Mining Institute.....	p. 128
Editorial—J. H. McGraw Jr.....	p. 128
Foreign Developments.....	p. 152
New Mining Companies.....	p. 158
Preparation Facilities.....	p. 161
Coal Publications.....	p. 162

greater than the 1935-39 average; steel workers, 113 percent; workers in all manufacturing industry, 120 percent; private building construction workers, 137 percent; cotton manufacture workers, 170 percent; quarrying and non-metallic mining workers, 158 percent.

Workers pay envelopes still buy more than they did in 1939, in spite of price increases, with bituminous coal miners leading the industries included, the Bureau of Labor Statistics pointed out in a study based on September wage figures. The \$71.19 average weekly figure for September, the bureau said, would amount to \$42.81 on the basis of 1939 purchasing power, as compared with the miners' average earnings in 1939 of \$23.88. Next to the miners in actual gain were building tradesmen and manufacturing employees, whose purchasing power, on the average, was about \$9 higher in September than it was in 1939. Some workers have gained only slightly, with electric power workers, for example, showing an increase of only 94c over 1939 on a purchasing-power basis.

## Mines Stockpile Coal To Beat Car Shortage

Large-scale stockpiling of coal adjacent to the mines, to avoid shutdowns because of shortage of railroad cars, was recently reported at two Ohio operations.

Coal from the Blaine mine of the Lorain Coal & Dock Co., Blaine, Ohio, was being trucked, it was understood, to an area at the old Wheeling Creek mine several miles east of the operation. It was to be loaded from there on the B. & O. for railroad fuel. The necessary track was being laid into

the area and 1,000 tons daily was expected to be dumped.

At the Willow Grove and Dun Glen mines of the Hanna Coal Co., coal coming from the tippie was reported being trucked to an "outdoor reservoir" with an estimated capacity of 100,000 tons for later shipment by rail. Use of the storage area was expected to save employees at the mines six or seven days a month in wages, or an estimated \$100,000 for workers at both mines.

## Silicosis Victim Is Awarded \$4,000

The appeal of the Lattimer Coal Corp., Lattimer Mines, Pa., and the Coal Operators Casualty Co. from a decision of the Pennsylvania Workmen's Compensation Board was dismissed Oct. 31 and the insurance company was directed to pay \$4,000 to Frank Mihalik, former employee of the coal company as a victim of anthraco-silicosis.

Mihalik had worked for the company for 36 years, ending his employment in December, 1945, because of anthraco-silicosis. His claim for total disability was allowed by the referee and affirmed by the board. The coal company contended that the Board erred in finding the requisite facts. However, Judge Flannery ruled that the evidence established that Mihalik was exposed for the required length of time.

## New Developments

• Acquisition of the Canyon Coal & Coke Co., Uniontown, Pa., which owns and operates the Canyon mine on Cheat Lake, near Morgantown, W. Va., by the Tasa Coal Co., Zelenople, Pa., was announced last month. Stock in the Canyon company was acquired by H. B. Salkeld, president of Tasa, and his associates from the Cochran, Higginbotham, Strawn and Rebok interests and new officers were elected as follows: Mr. Salkeld, president, treasurer and director; Carl J. Mulert, vice president and director; and Preston H. Vestal, secretary, general manager and director. R. J. Jones, who has been in charge of the operation of the Tasa mines in Ohio, has been

## NEW LOADING MARK TO SHOOT AT!



### Crew Loads 1,466 Tons in One Shift at Consol (Ky.) Mine

Topping all previous known records for tonnage per shift, 13 men and their section foreman at Mine 207, Consolidation Coal Co. (Ky.) Dunham, Ky., loaded 1,466 tons of coal on Sept. 25 and thus outstripped all competing teams employed at the company's properties in a contest that opened July 9 and closed Oct. 1. As top prize in the contest, the winners enjoyed a trip to New York at company expense and watched the Dodgers win two games and lose one in the World Series at Ebbetts Field.

The winning crew chalked up their record on the third shift, from 11:00 p. m. to 7:00 a. m. Major items of equipment used to set the new mark were a 14BU Joy loader, an 11RU Sullivan cutting machine, two Joy 6SC shuttle cars and one electric locomotive. The Elkhorn seam loaded averages 60 in. including parting.

The winners, shown above as they boarded the train for New York, are: Standing—Collins Holyfield, Joy machine operator; Charles Cross, shot-firer; Carol P. Sumlin, boomman; Cecil Green, Joy machine operator; Doyle Mullins, motorman; Thomas J. Helton, cutting-machine helper; Elbert Hensley, cutting-machine operator; Acie Meade, drill helper; Buster Rose, driller; and Noah Mullins.

named general superintendent of all Tasa deep mines and will take over operating management of the Canyon mine.

With the purchase of the Canyon mine, the Tasa company is expected to increase its coal production to more than 2,000,000 tons annually. The Canyon mine is fully mechanized, with coal-washing facilities, and has a rated capacity of 2,200 tons daily. The purchase was made, it is under-

Kneeling—Otto Meddings, section foreman; Fayette Puckett, shuttle-car operator; Nick L. Jurich, timber helper; Dock Adkins, Joy machine helper; L. H. Davis, mine foreman; and Clarence Collins, shuttle-car operator. Cecil Green, a member of the second-highest loading crew at Mine 207, substituted for Monroe Newsome, winning crew timberman, who was unable to make the trip.

As his share in Mine 207's victory, Supt. William Stapleton, accompanied by Mrs. Stapleton, enjoyed a trip at the company's expense to Morgantown, W. Va., Nov. 8, to see the Kentucky-West Virginia football game.

Before this contest, the record at Consolidation Coal Co. (Ky.) was 580 tons. During the competition, it was successively upped at the company's various mines to 673, then to 868, 877, 923, 1,023 and finally to the winning figure of 1,466 tons.

As far as *Coal Age* records show, the highest previous tonnage for a single shift at any mine was loaded by a 20-man crew at Mine 38, Consolidated Coal Co. (W. Va.), who sent out 1,402 tons on Sept. 16, 1946 (*Coal Age*, November, 1946, p. 126). The editors would welcome information about any other crew that may approach or exceed this new mark.

stood, principally for the purpose of balancing out the company's strip-mine tonnage with deep-mined coal.

Tasa also is reported to have recently closed contracts with Groves, Lundin & Cox, contractors of Minneapolis, to mine by stripping approximately 1,800,000 tons of coal in the Clarksburg, W. Va., area.

• Juliette Coal Co., Pittsburgh, Pa., has recently opened new stripping

operations in Pennsylvania and West Virginia. The new Raselas mine at Raselas, Elk County, Pa., on the Erie R.R., is to have a capacity of 500 tons daily. The new No. 30 mine, which is to strip the No. 5 Block seam at Tioga, Nicholas County, W. Va., on the B. & O. R.R., will reportedly be developed to 2,500 tons daily.

• A new strip operation, 600-tons daily capacity, has reportedly been opened at Piedmont, Ohio, on the B. & O. R.R., by the Harry J. Iles Coal Co., St. Clairsville, Ohio. The No. 8 seam is being stripped, and the Monongahela & Ohio Coal Co. is acting as sales agent.

• Frank Mashuda Co., Dunbar, Pa., recently opened a strip mine near Dunbar. The operation will have a capacity of 1,500 tons daily and will mine the Middle Kittanning seam.

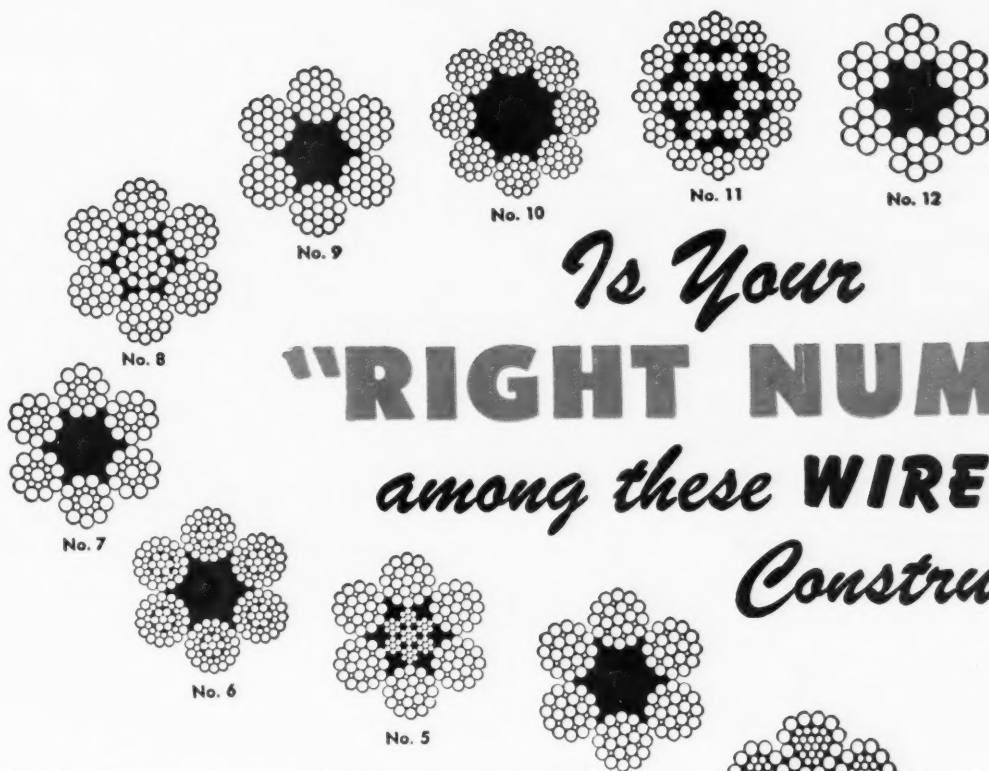
• Bower Mine, Inc., Clarksburg, W. Va., has opened a new strip operation at Daft, W. Va. The B. & O. R.R. is to construct a new siding with a capacity of 50 cars.

• Elmer F. Welch, operating as the Surface Mining Division, last month opened a strip mine at Ansted, W. Va., on the C. & O. Ry. Capacity is planned at 1,000 tons daily, from the Coalburg seam.

• Coal-mine development plans of the Jones & Laughlin Steel Corp. previously announced (*Coal Age*, October, p. 125) are expected to total \$18,917,000, according to an announcement by the company last month. The over-all plant improvement outlined by J. & L. totals \$100,000,000, of which \$65,000,000 is yet to be spent. Of the amount set aside for mine modernization, \$1,617,000 is to be spent for installation of launders for partial cleaning of coal at Vesta Nos. 4 and 5 mines. Consolidation of the two mines, erection of a three-part-separation coal washer, waste-disposal facilities and installation of larger mine cars will total \$17,300,000, it was said.

• Production of its recently opened Moss mine, near Clintwood, Va., reached 100,000 tons monthly in October, according to a recent announcement by the Clinchfield Coal Corp., Dante, Va. The company is said to have 10,000 acres of Clintwood-seam coal land, development of which is now possible with the 15-mile rail extension of the Carolina, Clinchfield & Ohio Ry. from its main line at Freemont completed last summer and a 14-mile branch of the C. & O. Ry. from Jenkins, Ky., still under construction. The company's new Meade mine, located on Meade Fork of Bowie Camp Creek, is scheduled to begin production in February. It is planned for a capacity of 80,000 tons monthly and will ship via the new C. & O. spur. Ultimate capacity of the Moss mine will be 200,000 tons monthly.

The two mines will be fully mechan-



*Is Your*  
**"RIGHT NUMBER"**  
*among these WIRE ROPE*  
*Constructions?*

Many factors determine the ultimate service you may expect from a Wire Rope. Among these are size, grade, construction and quality. But equally important is selecting the correct combination of these and other vital factors. Unless a rope fits the particular job to be done, the best results will not be had.

As "HERCULES" (Red Strand) Wire Rope is made in a wide range of both Round Strand and Flattened Strand constructions—Preformed and Non-Preformed—it offers the 'right number' for *any* heavy duty job.

And our Engineering Department is always ready to help you select the rope that will give you the most service for each dollar of its cost. Call on us anytime.

- No. 1—Style B Flattened Strand—Hemp Center
- No. 2—6 x 41 Round Strand—Metallic Core
- No. 3—Style G Flattened Strand—Hemp Center
- No. 4—6 x 19 Filler Wire Round Strand—Hemp Center
- No. 5—6 x 19 Filler Wire Round Strand—Wire Rope Center
- No. 6—6 x 37 Round Strand—Hemp Center
- No. 7—6 x 19 Seale Round Strand—Hemp Center
- No. 8—6 x 19 Round Strand—Metallic Core
- No. 9—6 x 19 Warrington Round Strand—Hemp Center
- No. 10—8 x 19 Filler Wire Round Strand—Hemp Center
- No. 11—18 x 7 Non-Rotating
- No. 12—6 x 7 Round Strand Haulage Rope—Hemp Center.

*All of these constructions are available either Pre-formed or Non-Preformed.*

# "HERCULES"

REG. U.S. PAT. OFF.



MADE ONLY BY

**A. LESCHEN & SONS ROPE CO.**

ESTABLISHED 1857

5909 KENNERLY AVENUE • ST. LOUIS 12, MISSOURI

NEW YORK • CHICAGO • DENVER • SAN FRANCISCO • PORTLAND • SEATTLE



## Coal, Business and Industrial Activities

		1947 to This date	1947 Over 1946 to Date
Est. anthracite prod., wk. end. Nov. 15.....	1,097,000	49,867,000	— 6.1%
Est. bituminous prod., wk. end. Nov. 15.....	12,600,000	538,070,000	+12.2%
Sales, domestic stokers, Sept., 1947.....	9,265	46,698	—65.9%

Source: U. S. Bureau of Mines and U. S. Bureau of the Census.

	Bituminous Coal Stocks [Thousands net tons]				Consumption [Thousands net tons]		
	Oct. 1, 1947	Days Supply	Sept. 1, 1947	Oct. 1, 1946	Sept., 1947	Aug., 1947	Sept., 1946
Electric Power utilities....	16,154	64	15,739	14,563	7,616	7,466	6,280
Byproduct coke ovens....	6,216	24	5,482	5,924	7,658	8,033	7,578
Beehive coke ovens....	"	"	"	"	891	897	729
Steel and rolling mills....	1,089	44	1,128	855	741	736	725
Cement mills....	909	41	894	891	662	672	656
Other industrials....	15,758	54	15,434	17,932	8,739	8,644	9,283
Railroads (Class I)....	6,227	22	6,522	8,800	8,450	8,527	8,790
Retail dealers....	2,017	9	1,958	3,402	7,036 <sup>b</sup>	5,058 <sup>b</sup>	8,383 <sup>b</sup>
Total.....	48,370	35	47,157	52,367	41,793	40,033	42,414

Source: U. S. Bureau of Mines. <sup>a</sup>Not available. <sup>b</sup>Retail dealer deliveries.

	Latest Week*	Month Ago	Year Ago
Business Week index of Business Activity, week end, Nov. 15.....	186.8	184.7	188.8
Steel ingot operations (% of capacity).....	97.0	97.1	91.4
Electric power output (million kw.-hr.).....	5,084	4,946	4,700
Crude oil prod. (daily avg., 1,000 bbl.).....	5,257	5,268	4,792
Misc. & L.C.L. carloadings (daily avg., 1,000 cars).....	89	93	89
All other carloadings (daily avg., 1,000 cars).....	63	67	63
Prices, spot commodity index (Moody's, Dec. 31, 1931 = 100).....	448.2	453.0	374.9
Prices, industrial raw materials (B.L.S., Aug., 1939 = 100).....	292.0	283.2	252.7
Prices, domestic farm products (B.L.S., Aug., 1939 = 100).....	396.7	397.3	310.9
Prices, finished steel composite (Steel, ton).....	\$76.09	\$75.41	\$64.45
90 Stocks, price index (Standard & Poor's Corp.).....	120.9	124.5	116.4

\*Date of latest week for each series on request.

ized and will eventually employ 1,800 men. The seam ranges from 5 ft. in height to as much as 18 ft. in some places. The 400-t.p.h. washery at the Moss mine is expected to be completed shortly. Construction of the tippie at the Meade mine has been started and a duplicate of the Moss washery is planned for the Meade mine. It is understood that the company is not planning to build company houses at either mine, but has sold lots to some employees and is working on a plan under which assistance may be given employees who wish to build or purchase their own homes.

Strip coal is reportedly being produced at the site of the Moss mine by the Dick Construction Co., of Hazleton, Pa., working under contract with Clinchfield.

- The ICC was expected to issue last month authorization for the Virginian Ry. to construct a 4-mile spur from its main line at Whidby, W. Va., into virgin coal lands now under development by the Beckley Smokeless Coal Corp., at Burma, W. Va. Close to \$400,000 is reported to have already been spent for mechanical equipment and in the development of the new Beckley mine, which is planned for a daily production of 1,500 tons. The company is said to have available about 60,000,000 tons of coal on a 2,200-acre site.

- The Red Jacket Coal Corp., Red Jacket, W. Va., announced Nov. 20 construction of a new strip mine at Buchanan, Va., just across the state

line from Jenkins, Ky. The operation is expected to open shortly.

- Development of a new truck-mine coal field on Irishman's Creek, a branch of Carr's Fork, in Knott County, is expected to very shortly add at least 5,000 tons daily to Eastern Kentucky production. Two loading ramps now under construction at Sassafra, the terminal of the Carr's Fork branch of the L. & N., are expected to have a capacity of 100 railroad cars daily, it is reported. One of the ramps is about completed, and other ramps are reportedly planned for the district. More than 25 new operations have been opened in the district in recent months, it is understood.

- Sam Bates, Whitesburg, Ky., announced last month that he had acquired the interests of his associates in the Star Elkhorn Coal Co. Included in the deal was the loading ramp, which he plans to enlarge from its present capacity of 3,500 tons daily to 5,000-5,500 tons daily as more coal is made available.

- Outstanding among the truck-mine developments in Eastern Kentucky are the operations of A. J. Dalton, Pikeville, Ky. Operating a number of small truck mines, Mr. Dalton's organization has pushed its 1945 tonnage of about 100,000 to 1,046,000 tons shipped in 1946, according to state reports, and is understood to be shipping at this rate or better in 1947. The coal is loaded on several loading ramps that are leased and is shipped via the C. & O. for export.

- Several truck mines and a loading ramp operated by the Cowan Creek Coal Co., near Whitesburg, Ky., have been acquired by the Red Ash Eagle Coal Corp., New York. Enlargement of the ramp from its present capacity of 40 tons daily and arrangements for additional coal is reportedly planned by the company.

- The Gap Branch Elkhorn Coal Co., Boldman, Ky., was recently organized by Tom Stephens, Edward Burgess and K. C. Mims for the development of truck mines in the Gap Branch area of Pike County. Shipments of 300 to 400 tons daily over the C. & O., are expected to begin shortly.

- Leasing of the former American Smelting & Refining Co. mine at Cokedale, Colo., to Higinio Cordova, of Trinidad, Colo., has been announced by the Florence Machinery & Supply Co., Denver, which recently purchased the mine and coking ovens from A. S. & R. It is understood that the mine is now producing about 100 tons of coking coal daily and that the new management plans to increase output to about 200 tons daily in the near future. In leasing the mine, Florence Machinery sold all the machinery and equipment at the operation to Mr. Cordova. The coke ovens are being dismantled and sold by the company.

- Discovery of high quality coking coal near Durango, Colo., was recently reported in tests being conducted by H. P. Ernst and Jack Beasley. The drilling, six miles southwest of the city, is said to have tapped two veins of coal, the first 10 ft. thick at the 360-ft. level, and another 12 ft. thick at 428 ft.

- First coal from the new Leesville (Ohio) mine of the Muskingum Coal Co. (*Coal Age*, April, 1947, p. 132), was shipped Oct. 31, according to James E. Harley, general superintendent for the company, who is in charge of the new operation. Production of 90,000 tons monthly was expected by the end of December and an ultimate capacity of 140,000 tons monthly is planned.

- Clearing of the site for the new mine of the Chicago, Wilmington & Franklin Coal Co. in Jefferson County, Illinois, was reported to have recently been begun. The mine, which is to be located near Waltonville, Ill., is planned for an eventual capacity of 6,000 to 7,000 tons daily. According to reports, twin 16-deg. slopes, one for coal and the other for machinery and supplies, will be driven to the No. 6 seam 750 ft. underground and ranging from 8 to 10 ft. in thickness. Men will use a cage in a vertical air shaft to be driven about a half-mile from the slope opening. The company is said to have 8,000 acres of coal land available in the Bald Hill Township area. The mine will be located on the Illinois Central, C. B. & Q., and Missouri Pacific R.R.s.

For the Toughest Service on Powered Wheels

# The General LCM



**Logging**  
**Construction**  
**Mining**



**New Angle Pulling Power**  
**More Rubber • Greater Traction**  
**Squeegee Power Cleats • Ejection Action**  
**Snag-Resistant Tread and Sidewall**  
**Heavy Shock-Absorber Plies**  
**Buttressed Highway Rib • Reinforced, Extra Heavy Beads**  
**Natural Rubber Impact Cushion**  
**Deeper, Cool-Running Shoulders**

**THE GENERAL TIRE & RUBBER CO. • AKRON, OHIO**

  
**The GENERAL L.C.M.**



ORIGINAL ROCKWELL KENT oil painting, entitled "Generator of Jobs," is presented to Ohio State University by Fred S. McConnell, past president of the National Coal Association, in behalf of the Bituminous Coal Institute. Left to right—Dr. Harvey H. Davis, vice president of the University; Edwin H. Davis, president, New York Coal Co., Columbus; Prof. Harry E. Nold, chairman of the Department of Mining Engineering at the University; Mr. McConnell; Dean Charles E. MacQuigg of O.S.U. College of Engineering; William Davis Turnbull, Junior Dean of the College of Engineering; and Howard J. Carswell, Bituminous Coal Institute.

- Purchase of the Eagle mine of the National Fuel Co., Erie, Colo., by the Imperial Coal Co., Denver, was reported last month. The mine which has reportedly been producing about 1,200 tons daily, was sold for \$149,000, according to the deed filed with the county clerk. Imperial Coal operates the Imperial mine near Erie.

- The new Mine No. 5 of the Pond Creek Pocahontas Coal Co., Bartley, W. Va., reportedly began production of coal in October and is now producing about 200 tons daily, with tonnage to be stepped up to 600 a day shortly. Work started last August on the mine, which is located between Raysal and Bradshaw, on the Dry Fork of Tug River. The Bradshaw seam of the Pocahontas series is being mined. Coal is lowered down a 1,200-ft. incline in six-ton monitors for loading into trucks that haul it to the Raysal slope. It is there dumped into a hopper which mixes it on a run-off-mine belt with coal from Mine No. 4 for preparation.

- Development of a coal mine in the Yukon Territory, with the assistance of the Canadian Government, to provide the Territory with a fuel supply other than wood, recently was announced in a statement by J. A. Glen, federal minister of resources. The operation, which has already been begun by the Yukon Coal Co., Ltd., is located at Tantalus Butte, near Carmacks, Yukon, on the Lewes River, a principal tributary of the Yukon River. An agreement has been made between the government and the coal company for "loaning such funds as may be necessary to equip and develop an efficient colliery to meet Yukon's coal requirements." Preliminary examinations of the area, about 100 air miles

northwest of Whitehorse, are said to indicate low mining costs and sufficient good quality bituminous coal to supply the Yukon's needs for many years. It is expected that development work can be pushed throughout the winter so that the mine will reach substantial production by the opening of the 1948 navigation season.

## Daily Radio Newscast Booked by B. C. I.

"Congress Today," a 10-minute daily newscast sponsored by Bituminous Coal Institute, public relations agency of the National Coal Association, went on the air over Washington's radio station WOL (1,260 kc.) for the first time Nov. 17, coinciding with the opening of the special session of Congress called by President Truman to consider stop-gap aid to Europe and inflationary tendencies at home. The broadcasts will continue Mondays through Fridays at 6 p.m. for the duration of the present Congress. Col. Albert L. Warner, former chief of the Washington bureau, Columbia Broadcasting System, and earlier head of the Washington bureau, New York *Herald-Tribune*, prepares and broadcasts the commentary.

The program covers highlights of the day in Congress, with "spot" news from the Senate, the House and congressional committees, statements by members of Congress and human-interest items. Each day's report also includes a brief news item about the coal industry. The program is designed to catch the interest of members of Congress and their staffs, government officials and the large corps of newsmen stationed in the capital.

## B.C.I. Oil Paintings Given to Universities

In two ceremonies in November and one in December, the National Coal Association continued its gifts of Rockwell Kent oil paintings to universities in coal producing states. Presentation of one of the paintings to Ohio State University, Columbus, was made Nov. 6 by Fred S. McConnell, past president, NCA. Grant Stauffer, president, Sinclair Coal Co., Kansas City, Mo., made a similar presentation to the University of Missouri School of Mines, Rolla, Nov. 19. Grover H. Creech, prominent alumnus and university trustee, was scheduled to make the presentation to the University of Kentucky, Lexington, Ky., Dec. 5.

In the near future, the remaining paintings will be presented as follows: to Purdue University, LaFayette, Ind., by R. H. Sherwood, president, Central Indiana Coal Co.; to Pennsylvania State College, State College, Pa., by George H. Deike, president, Mine Safety Appliances Co.; and to the University of Illinois, Urbana, Ill., by George F. Campbell, president, Illinois Coal Operators' Association. The University of Alabama also is expected to receive one of the paintings. Similar gifts already have been made to West Virginia University, Morgantown, W. Va., and the Carnegie Institute of Technology, Pittsburgh, Pa.

The paintings make up a series of nine which Rockwell Kent, noted artist and illustrator, made for BCI to symbolize the bituminous industry.

## Personal Notes

Charles F. Huber has resigned, effective Oct. 31 as chairman of the board of the Glen Alden Coal Co., Scranton, Pa., and its sales subsidiary,

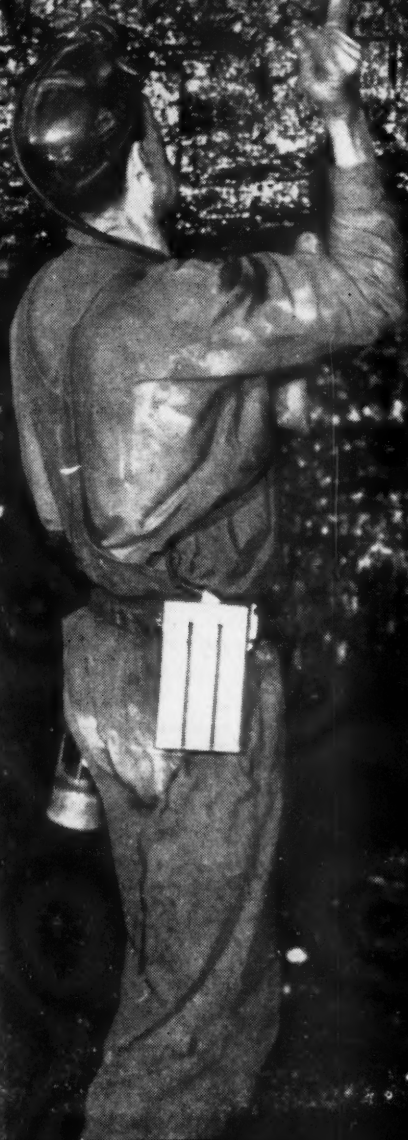


Charles F. Huber



# CARDOX

"THE NON-EXPLOSIVE MINING METHOD"



MAKES POSSIBLE THE USE OF  
LONGER CUTTER BARS

KEEPS LOADER PRODUCTIVE  
MORE HOURS EACH SHIFT

ELIMINATES TIME LOSSES  
CAUSED BY SMOKE AND NOXIOUS FUMES

PRODUCES COARSE SIZES, FREE OF  
SHATTER-CRACKS, THAT CLEAN, SHIP AND  
STORE WITH MINIMUM DEGRADATION LOSS

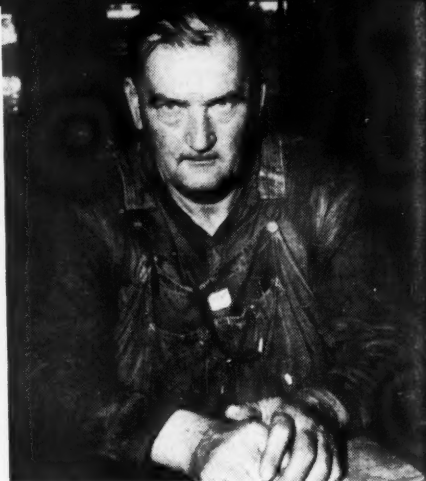
## CARDOX HARDSOCC DRILLING EQUIPMENT

Complete line of drilling  
equipment designed to  
give you the maximum in  
drilling efficiency.

**CARDOX CORPORATION** • BELL BUILDING • CHICAGO 1, ILLINOIS

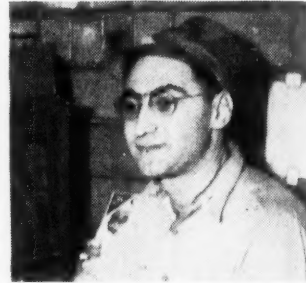


Officials of The Lorado Coal Mining Co., Lorado, W. Va.: rear row, J. R. Johnson (left), vice president, S. B. Johnson, president, J. Wm. Bahen, assistant to the vice president, C. & O. Ry., Stanley Johnson, Jr., assistant to the president, and F. A. Burke, sales manager. Front row, E. G. Schell, general manager of mines, and W. H. Barrett, assistant to the president, of The Lorain Coal & Dock Co., Ohio affiliate.



R. A. Bartlett, superintendent, Sahara No. 16 mine, Sahara Coal Co., Harrisburg, Ill.

## COAL MEN



Left to Right—John Garrett, pit foreman, Mine No. 23, C. W. Kincaid, tiple foreman, Paul Moeder, pit foreman, and S. Black, chemist, Mine No. 22, Clemens Coal Co., Pittsburg, Kan.



Left to Right—J. W. Holcomb, section foreman, and John Knight, chief inside mechanic, No. 3 mine, Rail & River Coal Co., Bellaire, Ohio; V. J. Luke, tiple foreman, and William A. Jones, Sr., pit foreman, No. 3 mine, Pioneer Coal Co., Walker, Mo.



G. A. "Slim" Williams (left), general superintendent, Liberty Fuel Co., Latuda, Utah, C. T. Dahlin, service engineer, Joy Mfg. Co., and L. J. Anderson, chief clerk, Liberty Fuel Co.



E. B. Nelson (left), assistant general superintendent of mines, Birger Thile, chief mining engineer, and S. D. Michaelson, special preparation engineer, Tennessee Coal, Iron & R. R. Co.



No.  
III.

N

ack,

Ohio;

irger  
para-

AGE

No.  
III.

N

ack,

Ohio;

irger  
para-

AGE



Dewey Marks (left), mine manager, and Mike Reshete, electrician, Sahara No. 16.



Night-shift supervisors at Stotesbury No. 11 mine, Coal Division, Eastern Gas & Fuel Associates, Helen, W. Va.: front, Al Grose (left), section foreman, Taft Gallimore, general night foreman, and Sam Pilliteri, section foreman. Rear row, Ray Vance, C. B. Clemons, and Carson Kelly, all three of whom are section foremen (photo, courtesy of Eastern Gas & Fuel "Associate").

## ON THE JOB



Left to Right—Robert "Bob" Houghtaling, tippie foreman, R. Houck, master mechanic, Charles Courtois, chief electrician, and C. H. "Pete" Minor, head mechanic, Tiger mine, Hume-Sinclair Coal Mining Co., Hume, Mo.



Left to Right—Frank DeGasperi, tippie foreman, Jose Johnson, pit foreman, and M. O. Buckley, chief clerk, Eagle-Cherokee Coal Co., Pittsburg, Kan.; W. C. Besheer, chief engineer, Reliance mine, Crowe Coal Co., Clinton, Mo.



John Stachura (left), production engineer, J. E. Elkins, superintendent, and Eugene Downer, safety engineer, Warwick mine, Duquesne Light Co., Greensboro, Pa.



M. K. Trice (left), chief electrician, J. H. Ray, preparation foreman, F. M. Kirkpatrick, weighman, and W. E. Self, superintendent, Barney mine, Alabama Ry-Products Corp., Cordova, Ala.





George A. Roos

the Delaware, Lackawanna & Western Coal Co. Mr. Huber, who will retain membership on the boards of the two companies, terminates more than a half century of active service in the anthracite industry. Beginning his mining career at an early age with the mining engineering department of the Lehigh & Wilkes-Barre Coal Co., he became chief engineer in 1898 and general superintendent in 1903. In 1909 he was named vice president and general manager and became president of the company in 1914. When Lehigh & Wilkes-Barre was acquired by the Glen Alden Coal Co. Jan. 1, 1930, Mr. Huber was elected chairman of the board of Glen Alden and continued in that post until the present, except for a two-year period in the middle thirties when he acted as administrator of an industry agreement. Mr. Huber had been president of the Anthracite Institute and was prominent in the negotiation of many wage contracts. During the first world war, he represented the anthracite industry in contacts with the Fuel Administration and in World War II was a member of the Solid Fuels Advisory War Council.

Several changes of top personnel of the Philadelphia & Reading Coal & Iron Co., Pottsville, Pa., have been announced, effective Nov. 1. **George A. Roos**, general manager of the company, has been named vice president in charge of operations. **Edward G. Fox**, president, Shen-Penn Production Co., a P. & R. subsidiary, has been named general manager to succeed Mr. Roos. **George J. Clark**, chief engineer for Shen-Penn, has been made president of that company. **Charles E. Brown**, formerly mining engineer, has been appointed P. & R. stripping engineer, and is succeeded as mining engineer by **Elmer F. Young**, previously Pottsville Division engineer. **John F. McCall** becomes Pottsville Division engineer. **Elmer S. Christ** has been appointed superintendent of the company's Locust Summit Division,

## MEETINGS

Mining and Metal Industry Committee, A.I.E.E.: winter meeting, Jan. 26-28, William Penn Hotel, Pittsburgh, Pa.

A.I.M.E.: annual meeting, Feb. 15-19, Pennsylvania Hotel, New York.

Chicago Stoker Exposition, under the auspices of Chicago Merchants Association and Midwest Stoker Association: Mar. 11-17, Commonwealth Edison Assembly Hall, Chicago.

Canadian Institute of Mining and Metallurgy: Golden Jubilee and annual meeting, week of Apr. 6, Vancouver, B. C., Can.

Tenth Annual Midwest Power Conference, sponsored by Illinois Institute of Technology: Apr. 7-9, Sheraton Hotel, Chicago.

succeeding **Fred C. Caldwell**, who retires. **Emil R. Ermert**, formerly attached to the P. & R. engineering department in the Mahanoy Division, has been named chief engineer of the Shen-Penn Production Co., replacing Mr. Clark. **Clyde H. Stephens**, P. & R. general sales manager, has been made vice president in charge of sales. **W. P. Bioecher** has been named president of the Berks Building Corp., a P. & R. subsidiary, in addition to his present duties as assistant to the president of P. & R.

**D. L. Freiler**, superintendent of the company's Locust Gap colliery, Locust Gap, Pa., since 1939, has been appointed superintendent, Oak Hill colliery, Minersville, Pa. **John Koppinger**, mine foreman at Locust Gap since 1932, has been named superintendent to succeed Mr. Freiler, and he is succeeded by **Ray Minnich**, assistant mine foreman since 1930. **Leo Brady**, who has been acting as superintendent of the Oak Hill colliery, continues in a supervisory capacity at that operation.

**Dennis K. Scott** has been named coal production manager, Eastern Coal Corp., with headquarters at Stone, Ky. Mr. Scott, who recently has been making a study of coal-production methods at several of the company's properties, has had extensive engineering experience in coal mining in the United States and prior to the war was for some years engaged in mining operations in the Far East.

**Dewey Looney**, formerly section foreman, has been appointed assistant mine foreman, Mine No. 204 Consolidation Coal Co. (Ky.), Jenkins, Ky. **B. V. Draughn**, previously dispatcher, has been made section foreman at Mine 204, and **Victor Mullins**, repairman, has been appointed assistant maintenance foreman. At Mine No. 207, **H. C. Hall** has been appointed section foreman, and **Jeff Hollyfield**, assistant maintenance foreman. **Lu-**



Edward G. Fox

**ther M. Kirklin** has been advanced to section foreman at the company's Clover Splint mine, and **T. N. Crothers**, repairman, has become assistant maintenance foreman at Mine No. 155. **Eugene P. Auxier**, associated with Consol from 1929 to 1941, has returned to the company as supervisor of supplies.

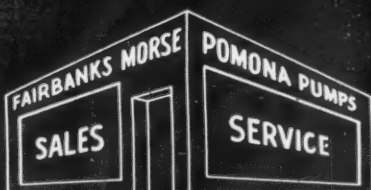
Consolidation Coal Co. (W. Va.), Fairmont, W. Va., has announced several changes in supervisory personnel. At Mine No. 63, Monongah, **Thomas E. Dean** has been appointed section foreman, and **H. K. Ross** and **Stanley Kuzniar** have been made section foremen at Mine No. 93, Jordan. At Mine No. 98, Nora, **L. H. Riggs**, formerly section foreman at Mine No. 63, has been named assistant mine foreman. **Paul Hay** and **Wayne A. McCurdy** have been appointed section foremen. **Arley L. Haines** has been promoted to maintenance foreman at Mine No. 98, replacing **L. H. Winger**, resigned.

**Major W. W. Inglis**, who recently retired as president of the Glen Alden Coal Co., has opened offices in the Mears Bldg., Scranton, Pa., and will act as a consultant for anthracite producing companies. Major Inglis continues as a director of Glen Alden.

**Thomas N. Reese**, Glenburn, Pa., former Lackawanna County chief detective, was recently appointed chief inspector for anthracite stripping operations by Gov. Duff and was to assume his duties immediately.

**H. A. Howard**, Calgary, Alberta, Canada, has been elected president, International Coal & Coke Co., Coleman, Alta., Canada. **A. L. Johansson**, Trail, B. C., has been elected vice president, and the following, all of Trail, have been named directors: **R. G. Anderson**, **Gordon A. Wallinger** and **R. R. McNaughton**.

**Griffith T. Powell**, 70, safety instructor at the U. S. Bureau of Mines



*F-M Centrifugal Pumps: Double-suction, side-suction, multi-stage, single-flow, vertical—all types, modifications and sizes*

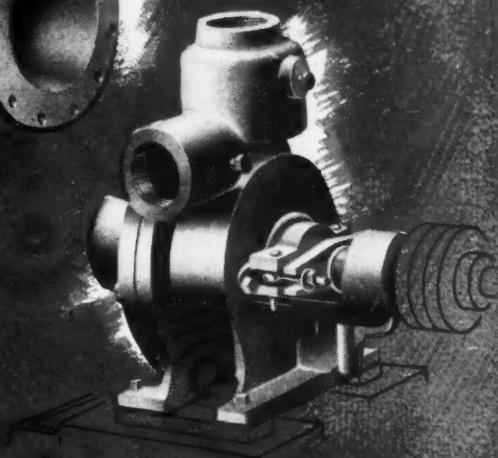
## WHAT MAKES A GOOD PUMP DEALER?

A pump dealer is as good as the line he sells, and the facilities he maintains for servicing his customers' pumps.

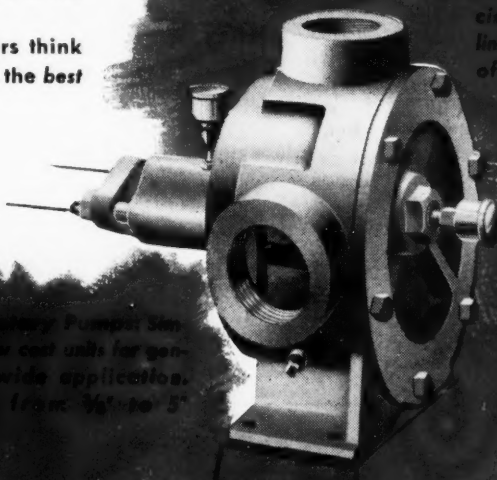
You look to a good dealer for a broad line of pumps—with so many types and sizes that he can give you unprejudiced advice...

You look to a good dealer for the benefits of a service organization that's ready and able to solve your pumping problems at the drop of a hat...

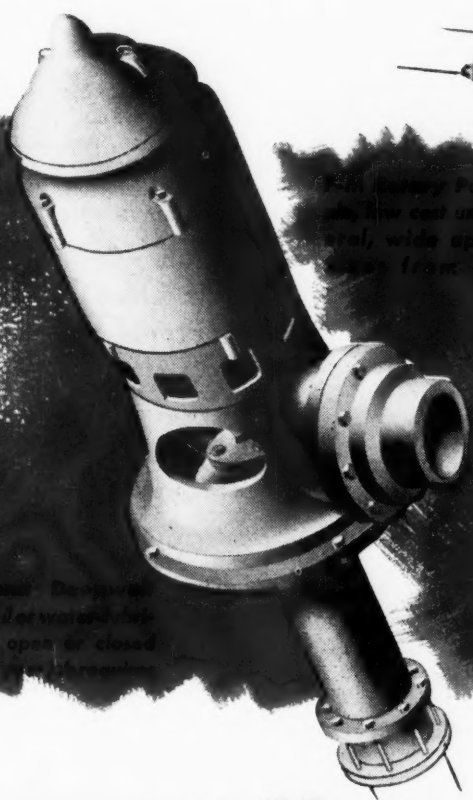
That's why so many pump buyers think of their Fairbanks-Morse dealers as the best in the business.



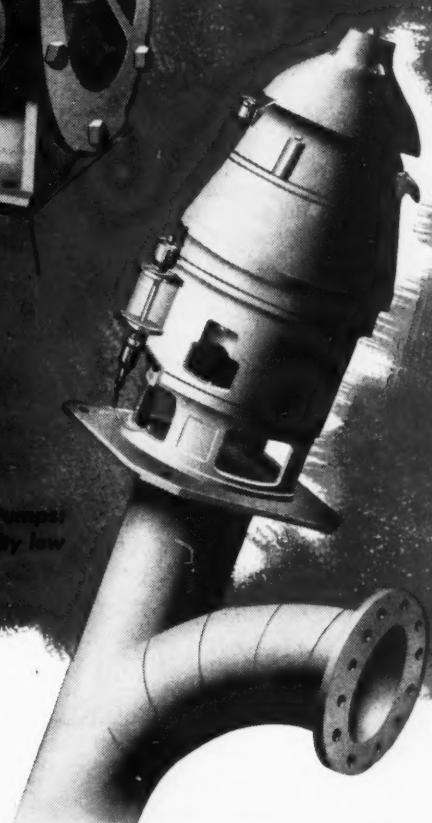
*Westco Turbine Pumps: Precision-built, with renewable liners for high head pumping of wide variety of liquids*



*F-M Heavy Pumps: Simple, low cost units for general, wide application. Sizes from 3/4" to 5"*



*F-M Pomona Deepwell Turbines: Oil or water, self-priming; with open or closed impellers at your discretion*



*F-M Propeller Pumps: For large capacity low head service*

# FAIRBANKS-MORSE



**A name worth remembering**

DIESEL LOCOMOTIVES • DIESEL ENGINES • PUMPS • SCALES • MOTORS • GENERATORS • STOKERS • RAILROAD MOTOR CARS and STANDPIPES • FARM EQUIPMENT • MAGNETOS



mine-safety station at Norton, Va., retired Oct. 31, after more than 30 years of government service. Mr. Powell, who first joined the Bureau in 1911 as a first-aid miner, spent his early years with the Bureau at the mine-safety station at Evansville, Ind. From 1933 to 1938 he was employed as a mine superintendent for the Crescent Coal Co. in Indiana and was assigned to Norton, Va., on his return to the Bureau in 1938.

**Lawrence Vance**, formerly section foreman, Wyoming mine, Red Jacket Coal Corp., Wyoming, W. Va., has been appointed safety inspector at that mine, replacing **Roy Richardson**, who resigned to join the state bureau of mines.

**W. L. Meadows**, manager of the Beckley office of the West Virginia employment service, has resigned to become a federal mine inspector. Mr. Meadows previously was a mine foreman for the Coal Division, Eastern Gas & Fuel Associates.

**Jesse J. Belcher**, Hatfield, Ky., has been appointed a Kentucky mine inspector for the eastern district, covering Letcher, Pike, Floyd, Perry and Harlan Counties.

**Charles E. McGlaughlin**, formerly executive secretary of Pittsburgh's North Side Chamber of Commerce, has joined Bituminous Coal Research, Inc., as a special representative, succeeding **T. A. Day**, who recently joined the Bituminous Coal Institute.

## Obituary

**Willard I. Webb Sr.**, 80, director and honorary chairman of the board of the George M. Jones Co., Toledo, Ohio, died Oct. 30 at his home in Toledo. Mr. Jones had retired as president of the company last year, after more than 50 years in the coal industry. He first joined the company in 1900, becoming president in 1934 on the death of Mr. Jones. Mr. Webb was instrumental in the establishment of a number of business organizations in the area and was prominent in civic affairs in Toledo.

**Dan J. Reed**, 53, safety engineer for the Tennessee Coal, Iron & R.R. Co., died Nov. 11 at Birmingham, Ala., following a heart attack suffered in the Hamilton Slope mine. Mr. Reed had been associated with the company for 30 years.

**David M. Spratt**, chief mechanical and construction engineer, Snyder & Swanson, Inc., Sunnyhill Coal Co., and Sunnyhill Mining Co., Pittsburgh, Pa., was killed Nov. 12 when a small plane in which he was a passenger crashed and burned near Youngstown, Ohio. Mr. Spratt had chartered the plane that morning at the Burgettstown, Pa., airport to fly to Youngs-

## EQUIPMENT APPROVALS

Four approvals of permissible equipment were issued by the U. S. Bureau of Mines in October, as follows:

Joy Mfg. Co., Sullivan Division—Type 10RU universal cutting machine, rubber-tired mounted; two motors, 26½ and 50 hp., 500 volts, d.c.; Approval No. 529A; Oct. 10.

Joy Mfg. Co., Sullivan Division—Type 10LV low-vein cutting machine, track-mounted; 50-hp. motor, 250 and 500 volts, d.c.; Approvals Nos. 589 and 589A, respectively; Oct. 3.

Joy Mfg. Co., La-Del Division—Type SF-32 elevating conveyor; 10-hp. motor, 230 volts, d.c.; Approval No. 590; Oct. 29.

Goodman Mfg. Co.—Type 142K04C storage-battery locomotive; Approval No. 1540; Oct. 27.

town to secure parts for research work on special mining machinery he was conducting for the company. The plane, piloted by a former Air Corps officer, had just left Youngstown when a forced landing was attempted. Mr. Spratt, who had been associated with the Snyder & Swanson organization for 18 years in various capacities, earlier this year was in charge of the construction of the company's new strip operation and washer at New Lexington, Ohio.

**Gaetano Capone**, owner of the Capone Coal Co., died Nov. 18 at his home in Yatesville, Pa., near Wilkes-Barre, following a heart attack. Mr. Capone had been an independent anthracite operator for 16 years.

## Association Activities

**Mineral Producers Association**, at a meeting of the board of directors Oct. 25 in Pittsburgh, elected the following board officers: chairman, **R. R. Bowie**, Bowie Coal Co., Grove City, Pa.; vice chairman, **R. S. Walker**, Bradford Coal Co., Bigler, Pa.; secretary-treasurer, **R. T. Laing**, executive secretary of the association; and director, **Harry Ford**, Ford & Gaskill, Greensboro, Pa.

## 1947 Coal Age Index

Because of the continuing shortage of paper, the index to *Coal Age*, Volume 52, January-December, 1947, is not bound into this issue. However, this index has been prepared and is available without charge to any *Coal Age* subscriber. Address: The Editor, *Coal Age*, 330 W. 42nd St., New York 18, N. Y.

**Indiana Coal Operators Association**, Terre Haute, Ind., at a recent meeting re-elected all its officers, as follows: **Charles N. Templeton**, president; **Henry Smith**, vice president; **Harvey Cartwright**, commissioner; and as members of the executive board, **Mr. Templeton**, **Mr. Smith**, **E. F. Stevens**, **A. K. Hart**, **P. L. Donie** and **William Zeller**.

**Hazard Coal Operators Association** re-elected **George Fitz** president, and **A. E. Silcott**, vice president, secretary and treasurer, at the annual meeting held in Lexington, Ky., Nov. 14. The business session, which took the entire afternoon, was followed by a social gathering and a banquet. **Jack Metcalf**, affiliated with the L. & N. R.R. legal department, acted as toastmaster at the banquet and introduced **Joseph E. Moody**, president, Southern Coal Producers Association, **John Tilford**, vice president, L. & N. R.R., **John D. Battle**, executive secretary, National Coal Association, and **Tom Underwood**, editor, Lexington *Herald*.

**Harlan County Coal Operators Association** held its 31st annual meeting in Harlan, Ky., Nov. 19. The meeting was well attended by members and guests, who included railroad men and coal men from other fields, and all officers were re-elected, as follows: **Pearl Bassham**, president; **C. V. Bennett**, vice president; and **George S. Ward**, secretary.

At the evening banquet, with Judge **Charles I. Dawson**, attorney for the Association and former federal judge, acting as toastmaster, the group heard talks by **Joseph E. Moody** and **Walter R. Thurmond**, president and secretary of the Southern Coal Producers Association, and **John D. Battle**, executive secretary of the National Coal Association, who outlined NCA's program adopted at Chicago.

## Fires Hit Ohio Tipple, West Virginia Headhouse

Two mines of the Ashland Coal & Coke Co. were made idle Oct. 26 by a fire that swept the headhouse and part of the loading chute at Ashland, W. Va. Cause of the blaze was undetermined and there was no estimate of damage.

Earlier, on Oct. 20, fire destroyed the Midvale Coal Co.'s tippie near New Philadelphia, Ohio, causing damage estimated at \$300,000. The fire was believed to have been started by spontaneous combustion. Firemen summoned from nearby towns to fight the flames were delayed by dense fog. Miners hastily scattered rock dust in the mine slope to prevent spread of the blaze into the mine. A railroad car and a pickup truck parked under the tippie also were destroyed. The tippie had a capacity of 2,500 tons per day. Company spokesmen stated that the loss was fully covered by insurance and that the mine would reopen within 24 to 48 hours.



tion,  
reet-  
fol-  
resi-  
ent;  
ner;  
ative  
, E.  
onie

tion  
and  
tary  
eting  
The  
ntire  
ocial  
Met-  
R.R.  
aster  
seph  
Coal  
ford,  
n D.  
ional  
nder-

As-  
eting  
eting  
and  
men  
and  
ows:  
Ben-  
re S.

udge  
the  
udge,  
roup  
and  
and  
Pro-  
Bat-  
Na-  
lined  
cago.

se  
coal &  
by a  
and  
land,  
s un-  
imate

royed  
New  
mage  
was  
d by  
remen  
fight  
e fog.  
ust in  
ad of  
ilroad  
under  
The  
tons  
stated  
ed by  
would

L AGE

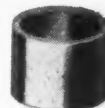


## TOUGH CUTTING IS OUR BUSINESS

**N**O CUTTING job is too tough for the Cincinnati Chain. Made of fine alloy steel, heat treated and drop forged, The Cincinnati Chain is designed and engineered to give top performance at all times. Constructed to withstand abuse, the Cincinnati Chain reduces wear on the entire cutting machine and places greatest wear on inexpensive, easily replaceable parts. For efficient time tested performance, greater tonnage and lower cutting costs, use Cincinnati Coal Cutting equipment.



Hardened Eccentric Pin is designed so it can't turn in block . . . placing joint Wear between pin and insert.



Alloy Steel heat-treated Rivet that holds bearing pin against longitudinal displacement. Easily removed.

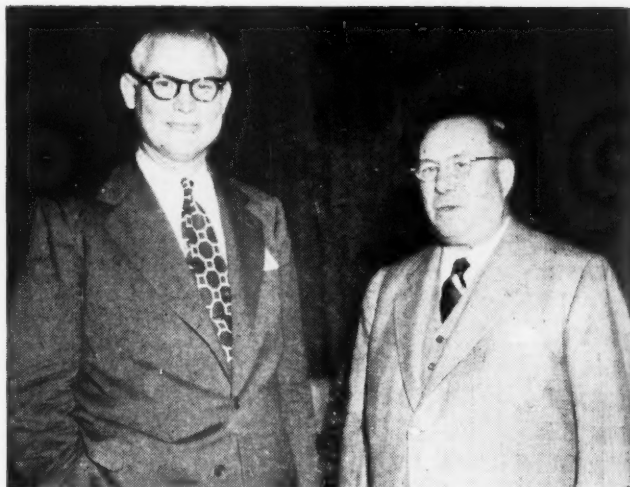
Replaceable long-life, hardened alloy steel Connector Insert that gives new factory joint accuracy to a worn connector.

# THE CINCINNATI MINE MACHINERY CO.

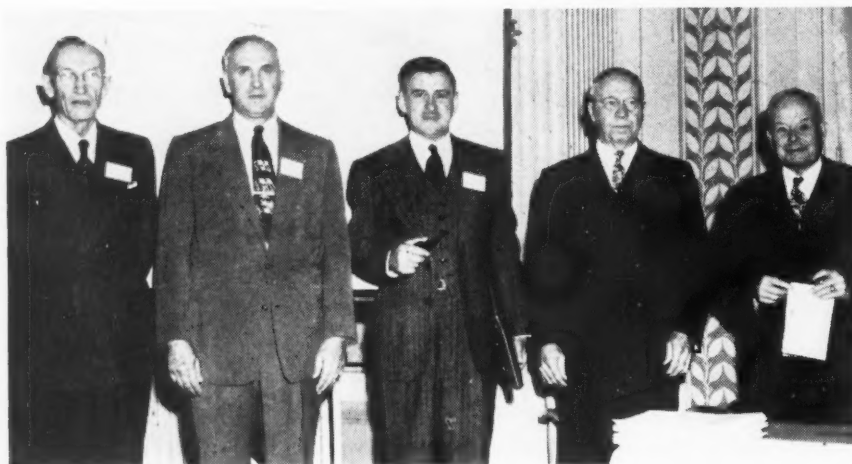
2983 SPRING GROVE AVENUE • CINCINNATI, OHIO



T. G. Crawford (left), general manager, Valier Coal Co., who presided at the second session; Howard Herder, fuel engineer, Sahara Coal Co.; and B. E. Schonthal, B. E. Schonthal & Co., re-elected institute secretary-treasurer.



Joseph Pursglove Jr. (left), vice-president, research, Pittsburgh Consolidation Coal Co., Pittsburgh, Pa., talks things over with Harry M. Moses, president, H. C. Frick Coke Co., also of Pittsburgh.



R. L. Adams (left), general superintendent, Old Ben Coal Corp., who presided at the first session; Fred J. Bailey, safety director, mining division, Cardox Corp.; J. W. MacDonald, chief engineer, Old Ben Coal Corp.; Robert M. Medill, retiring institute president; and Thomas Moses, director, Illinois Department of Mines and Minerals.

## Illinois Mining Institute Holds 55th Annual Meeting

MINE FIRES, preparation of fine coal, Illinois stoker coal and developments in the production of gaseous and liquid fuels from coal were the major program topics at the 55th annual meeting of the Illinois Mining Institute, Abraham Lincoln Hotel, Springfield, Ill., Oct. 31. Harry M. Moses, president H. C. Frick Coke Co., Pittsburgh, Pa., was elected president for the coming year, succeeding Robert M. Medill. J. Roy Browning, vice president and commissioner, Illinois Coal Operators Association, Chicago, was chosen vice president and B. E. Schonthal, B. E. Schonthal & Co., also of Chicago, was re-elected secretary-treasurer.

"The unusually large number of fires in underground coal mines in recent

years has focused the attention of all mining men on the cause and extinguishment of mine fires," declared Fred J. Bailey, safety director, mining division, Cardox Corp., Chicago, in analyzing new developments in underground fire-fighting equipment at the opening session, with R. L. Adams, general superintendent, Old Ben Coal Corp., West Frankfort, Ill., presiding. "Some of these fires possibly could have been eliminated by improved safety procedures. However, no one can doubt that fires will continue to occur even in the best regulated mines. Improved fire-fighting equipment and technique therefore are of prime importance in the struggle to save lives and dollars.

"During 1944, 88 fatalities occurred

in three major mine fires. This does not include a large number of small fires in which less than 5 men were killed and much production time was lost. From 1869 to 1945 inclusive, there were 46 major disasters resulting in the loss of 1,258 lives . . . This record indicates that the problem is serious and shows no signs of abatement. Because of the highly combustible nature of coal, dry timbers, explosives and other materials usually present in coal mines, the potential hazard of fire is always present. This is true whether the mine is dry or wet and whether it is gaseous or non-gaseous. The only factor needed is a source of ignition, which may be provided by electricity, explosives, open lights or even by spontaneous combustion under certain conditions.

"Obviously, fires cannot be eliminated, but a great deal can be done to control and extinguish them before they can become dangerous. Incipient fires can be extinguished fairly easily if the proper extinguishing agent is applied soon enough. The choice of the proper extinguishing agent is not a simple matter. The nature of the fire itself is variable since it may involve coal, wood, oil or electrical equipment. In each case the conditions and requirements are different and no one known agent is satisfactory for all types.

"Coal and wood produce smoldering deep-seated fires containing great quantities of heat which must be removed before extinguishment is complete. This can be done by applying water copiously. However, the heavy clouds of steam generated tend to obscure vision and weaken the roof structure. A better method is to cover or seal in the burning material to prevent the entrance of oxygen necessary for combustion. The contained heat will then be dissipated slowly by conduction to adjacent material.

"Oil fires, on the other hand, are surface fires and do not in themselves

**For Longer Wear—Less Repair**  
**Use JALLOY Heat Treated Steel**

**J&L  
STEEL**



**SAVE "TIME-OUT" FOR REPAIRS—SAVE STEEL—SAVE MONEY WITH ABRASION RESISTING JALLOY**

You can reduce your labor and steel costs—increase your productive operating time, by using heat-treated Jalloy, the special abrasion-resistant steel. Heat-treated Jalloy reduces labor, material and continual maintenance expense on equipment handling abrasive materials. Heat-treated Jalloy reduces down-time for repairs because of its longer life!

Heat-treated Jalloy is a custom-made manganese-molybdenum steel, designed by J & L to meet your specific needs in resisting wear and heavy shocks. Its strength, toughness and resistance to abrasion over ordinary steel has been *proved* in handling rock, coal, slag, sand, cinder and other abra-

sive materials. Heat-treated Jalloy is available in bars and plates that can be welded readily to form tough, long-wearing surfaces on truck beds and tailgates, scraper and bulldozer blades, dragline and power shovel buckets, rock crusher parts, sand blast cabinets, chutes for mines, quarries and mills.

Manufacturers of new equipment can increase the salability of items made from JALLOY—by giving longer wear, less repair.

Maintenance men can increase the life of old equipment by installing JALLOY in places where *wear* means *repair*.

If you are seeking the solution to a troublesome abrasive problem, heat-

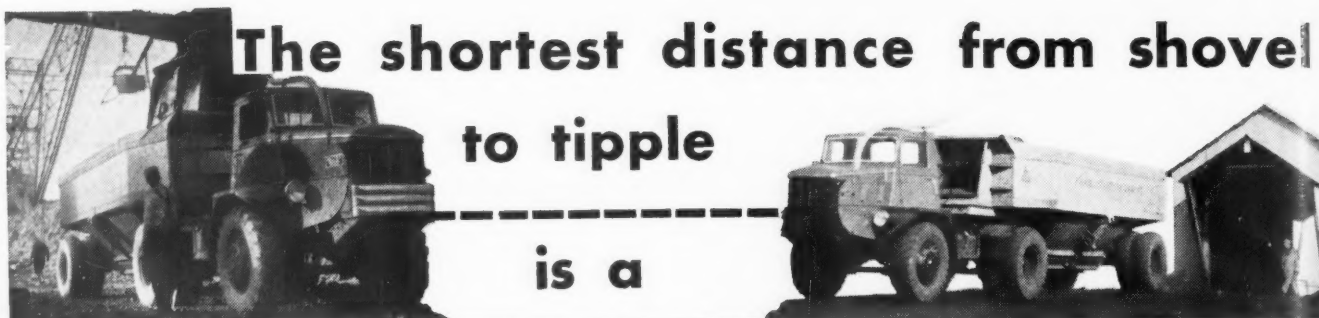
treated Jalloy is the answer. Ask a J & L representative to call and assist you. His experience in saving money and time on similar problems will be valuable. Call him in today and get the complete story on Jalloy, the steel for longer wear—less repair. Or write for your copy of "Jalloy" a technical bulletin giving typical physical properties, chemical composition, impact and hardness values and welding data. Address, Room 1012, Jones & Laughlin Bldg., Pittsburgh 30, Pa.



**JONES & LAUGHLIN STEEL CORPORATION**

Another example of J & L Steel at work Saving money for you . . .





## WALTER TRACTOR TRUCK



**H**IGH-TONNAGE Walter Tractor Trucks link your pit and plant together as a smooth-working team all year 'round. They keep an uninterrupted flow of coal moving to the tipple, no matter what the weather—no matter how bad the running conditions.

The Walter Four Point Positive Drive provides tremendous power and traction to haul 30 to 60 ton payloads on soft or slippery surfaces and up steep grades. The huge loads are hauled at speeds equalling smaller trucks. There is no wheel-spinning to stall loads, wear tires and gouge roads. Fewer units deliver greater tonnage, which reduces operating costs.

Designed throughout for open pit mine hauling, Walter Tractor Trucks are rugged, safe, easily handled. They incorporate such advanced features as three automatic locking differentials, suspended double reduction drive, tractor type transmission, hydraulic steering, air brakes, short wheel base, scientifically distributed weight. Models from 200 to 300 hp., gasoline, diesel and butane. Write today for detailed information.

**WALTER MOTOR TRUCK COMPANY**  
1001-19 Irving Ave., Ridgewood 27, Queens, L.I., N.Y.

**WALTER**  
**TRACTOR TRUCKS**

# POLITICAL ACTION—

## Labor's Blind Alley

**T**HE approach of the 1948 elections brings organized labor in America to a fork in the road.

Straight ahead lies the familiar route of free collective bargaining. Except for an occasional side trip, labor has been traveling it for years. On this road the role of government is to act as traffic cop, removing obstructions for all travelers.

The fork is the road of political action—the road to special privilege for labor. On it government is called upon to clear a special right of way for organized labor—to push aside all others.

*Which of these two roads will organized labor take?*

Most American labor leaders are now urging their followers toward political action. Their first objective is to “get” all members of Congress who voted for the Taft-Hartley Act. AFL plans to raise a \$5 million political combat fund through contributions and a per capita tax on its membership. CIO is soliciting \$1 donations for political action from its 6,000,000 members.

For their own sake, however, as well as for the welfare of the country as a whole, the rank and file of organized labor will do well to stop, look and listen before they turn their unions into political action squads. If they examine the facts for themselves, they will make two significant discoveries:

- I. Political action is a blind alley for labor.
- II. The Taft-Hartley Act is an essential bulwark of free collective bargaining.

A brief discussion of these two statements will show what they mean to organized labor.

### I

Political action is a blind alley for labor.

If there is any doubt about that statement, a good way to dispel the doubt is to look at European countries where organized labor has been following a political action line.

Britain, where the Labor Party is in power, is such a country. How is labor faring there? Measured by the good things money buys, the average hourly wage in Britain is less than two-thirds of what it is in the United States. Part of the difference may be accounted for by the fact that the British Isles are poorer in natural resources than the United States. Another reason is the war damage to Britain's plants.

But there are two other big reasons why the British wage earner is far behind the American worker in enjoying the good things of life:

1. The incentive to produce has been dulled by vote-catching programs which promise economic security and a levelling of incomes. Lulled by promises of cradle-to-the-grave security and discouraged by high taxes, the British have descended to a state neatly described by the *London Economist*:

*"Nobody gains anything from activity or suffers anything from inactivity."*

2. To run a program like Britain's requires more and more government functionaries. Civilian employees of the British government have increased by 50% since before the war, putting one worker out of ten on the government payroll. More and more people stop producing and spend their time instead cutting up what others produce. The result is smaller production, higher taxes and lower real wages.

The British Labor Party must accept most of the responsibility for this sorry state of affairs. It is due primarily to a program of political action by organized labor which promised the individual worker security and equality of income—but which can not deliver either because the incentive to work is gone.

The lesson for American wage earners is clear. Political action by unions to enforce the economic fallacy of more-and-more-for-less-and-less will end by impoverishing the working man—and bringing the nation to ruin.

Unions exist for collective bargaining, not for politicking.

## II

The Taft-Hartley Act is an essential bulwark of free collective bargaining.

Bargaining works satisfactorily only when both parties—management and labor—think they are getting a fairly even break.

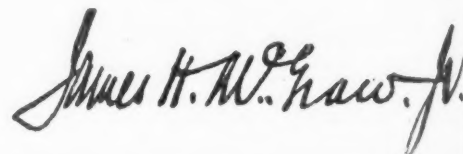
Management was very sure that the Wagner Act, as administered from 1935 to 1947, was giving employers the short end of the stick. Furthermore, management's feeling of frustration was no whim. It was justified by case after case where rights were granted to organized labor with no counterbalancing recognition of the rights of management, of individual workers or of the public.

The Taft-Hartley Act goes a long way toward establishing equality in employer-union relations. It may fall short of doing a perfect job. As a subsequent editorial in this series will show, it leaves virtually untouched the public menace of industry-wide bargaining and labor monopoly. And it leaves unprotected what should be the individual's right to hold a job without joining any particular organization. But it does provide some major safeguards for collective bargaining by striking at abuses.

Organized labor, therefore, has no cause to damn the members of Congress who voted for the Taft-Hartley Act. True, the law will check what has been an uninterrupted march of the labor union bosses toward absolute power. It will do so just as laws in the past—The Sherman Anti-Trust Act, for example—have checked management when it was too greedy. And, as the first section of this editorial points out, the time has come to check the march of the big labor bosses.

Fundamentally, the Taft-Hartley Act gives free collective bargaining a new lease on life. The old lease was running out because the Wagner Act stacked the cards against employers, against individual workers, and against the public.

The road to free collective bargaining is now clear of many of the most menacing obstructions. It is the only road for labor to take in its own self interest. Union workers who let their leaders lure them down the blind alley of political action will do so at their own peril—and at the peril of this great industrial nation.



President, McGraw-Hill Publishing Company, Inc.



toward  
lations.  
s a sub-  
t leaves  
indus-  
And it  
ndivid-  
ng any  
le some  
ing by

ause to  
for the  
ck what  
e labor  
ill do so  
ti-Trust  
gement  
section  
s come  
es.

ves free  
The old  
ner Act  
ainst in-

ning is  
nacing  
r labor  
a work-  
n down  
ill do so  
of this

any, Inc.



## LEONARDO MIGHT HAVE FLOWN

LEONARDO DA VINCI'S genius conceived a technically sound airplane and even the principle of the cylinder and piston (the latter in a steam cannon). But nearly four centuries passed before powered flight was a reality at Kittyhawk. So far was he ahead of the world that no man lived who could take up the torch which he kindled in the world's struggle for emancipation from creeping travel and crushing toil.

Today, internal-combustion power is a servant of man in a thousand ways that even a Leonardo could not have conceived. The matériel of agriculture, commerce and industry moves freely through the world's trade channels on planes, ships, trains and trucks powered by gasoline and Diesel engines. Construction, re-construction, eventual world abundance are within reach with internal-combustion engines at their specialized tasks.

AMERICAN BOSCH CORPORATION, SPRINGFIELD 7. MASS.



### SERVING POWER WHICH SERVES MANKIND

American Bosch serves the internal-combustion-engine industry in three vital ways:

**ENGINEERING.** 1,200,000 man-hours of it have been poured into Diesel fuel injection alone—other millions into ignition.

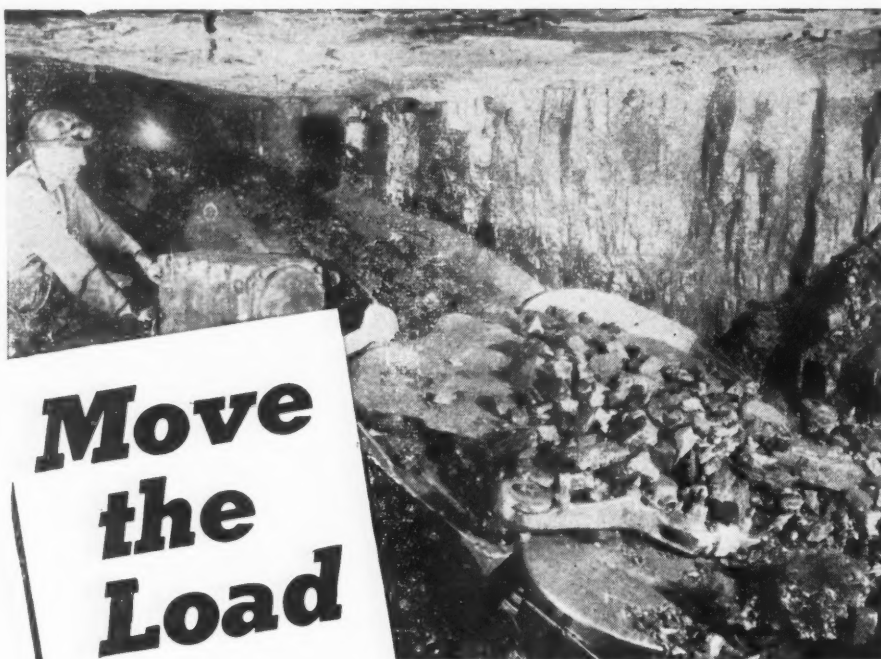
**PRODUCTION.** Premium performance has been a consistent goal in the production of hundreds of thousands of Diesel injection systems and millions of electrical units.

**MAINTENANCE.** The world over, American Bosch authorized service stations keep the equipment operating efficiently.

# AMERICAN BOSCH

PARTNERS IN THE PROGRESS OF POWER

FUEL INJECTION • AUTOMOTIVE AND AVIATION ELECTRICAL PRODUCTS



**Move  
the  
Load**

## OFF CABLE MAINTENANCE

When costly equipment shutdowns plague production because power supply cables don't measure up to the job—switch to Deltabeston,\* and take a load off your repair crews.

Deltabeston apparatus and motor lead cables help you fight production tie-ups. They're designed and built to keep mine equipment hard at work in spite of overheating and rough use.

Tough Deltabeston cables are protected against heat with two layers of felted asbestos insulation. A varnished fabric layer resists moisture. A sturdy, asbestos braid covering takes abrasion and rough handling in its stride. And it's a natural for protection against the ravages of greases and oils.

For fewer shutdowns on the job, remember Deltabeston. It's made to help you keep production up, maintenance down. Write for data or engineering assistance. Section Y65-1214, Appliance and Merchandise Department, General Electric Company, Bridgeport 2, Connecticut. \*Trade-mark Reg. U. S. Pat. Off.

### Beat Motor Heat with Deltabeston Magnet Wire

If you do your own motor winding — or, if you send it to an outside shop, be sure to specify Deltabeston Magnet Wire. It's made in round, square, and rectangular shapes, and is insulated with asbestos or glass for lasting protection and service.

**Deltabeston**  
**WIRES and CABLES**

**GENERAL  ELECTRIC**

## Illinois Officers

Harry M. Moses, president, H. C. Frick Coke Co., Pittsburgh, was elected president of the Illinois Mining Institute at its 55th annual meeting. Mr. Moses succeeds Robert M. Medill. Other officials and members of the executive board also were chosen as follows:

Vice president—J. Roy Browning, vice president and commissioner, Illinois Coal Operators' Association, Chicago.

Secretary-treasurer—B. E. Schonthal, B. E. Schonthal & Co., Chicago (re-elected).

Executive board—new members—D. H. Devonald, Peabody Coal Co.; Carl T. Hayden, Sahara Coal Co.; John Rodenbush, Chicago, Wilmington & Franklin Coal Co.; and Prof. Harold L. Walker, Department of Mining and Metallurgical Engineering, University of Illinois.

Executive board, continuing in office—R. L. Adams, Old Ben Coal Corp.; Richard Baldwin, Midwest-Radiant Corp.; Alex Duncan, Superior Coal Co.; G. S. Jenkins, Consolidated Coal Co.; E. R. Keeler, Franklin County Coal Corp.; T. J. Thomas, Valier Coal Co.; A. H. Truax, Truax-Traer Coal Co.; and L. A. Wasson, Wasson Coal Co.

involve deep-seated embers. Foam can be used to cover open pools, but it is not effective on three dimensional fires, such as occur in hydraulic machinery. Water is useful only when applied in the form of a fine spray or fog. Carbon-dioxide and dry powder are the most effective extinguishing agents commonly available.

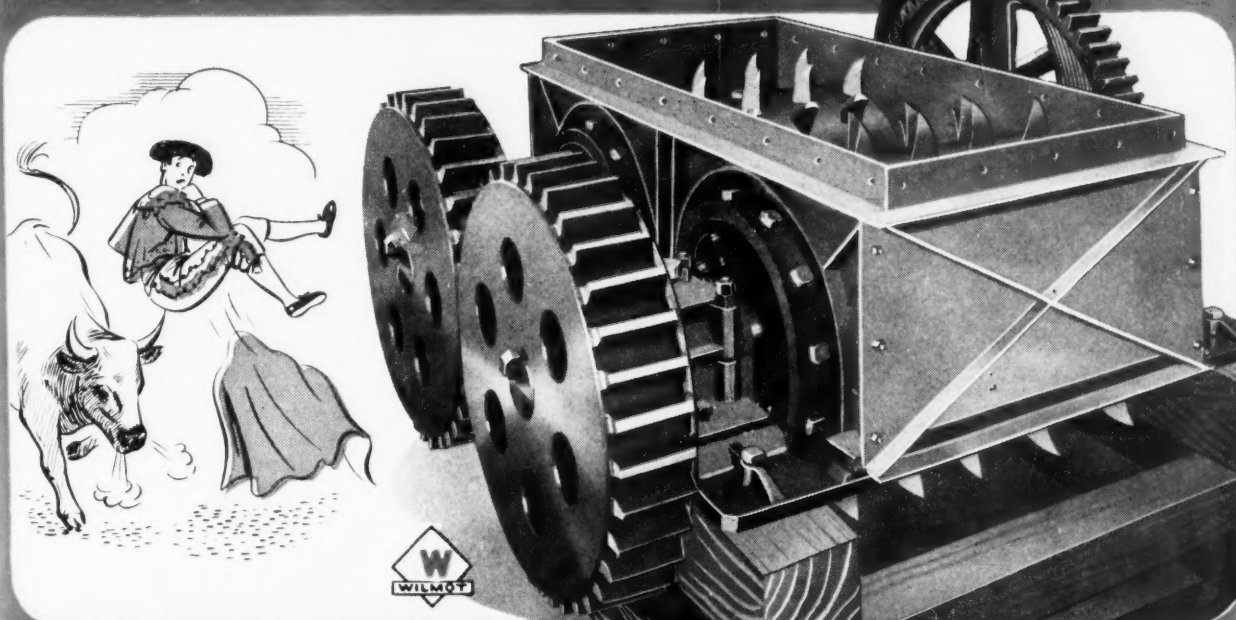
"Electrical fires present an additional requirement in that the extinguishing agent must not conduct electricity. Carbon-dioxide and dry powder fulfill this requirement. Carbon tetrachloride also could be used but, because of its toxicity, is undesirable in closed spaces. Carbon-dioxide is most desirable because it is effective and leaves no residue.

"The greatest difficulty in extinguishing any mine fire lies in getting to the fire as quickly as possible after it is discovered. Obviously, the equipment must be compact and mobile. Further than that, the possibility of encountering heat, smoke and gas must be considered. Means must therefore be available for personnel to work in this atmosphere or to improve conditions by ventilation."

All these factors, said Mr. Bailey, were considered in the design of the Cardox mine-fire car providing two types of extinguishing agents: (1) a sealing or covering material that quickly gels and (2) carbon-dioxide. "By means of these two agents, it is



# PRODUCTION BULL WITH *Precision* TOUCH



## WILMOT CRUSHER ROLLS



*Newly Designed for . . .*

- 1 Higher Uniformity in Sizing.
- 2 More Tonnage, Less Fines.
- 3 Less "Down Time" and Maintenance Costs.

Today precision engineering in coal crushers is as important as bull strength. For that reason there is real significance for you in the plant records of the most recently designed series of Wilmot crusher rolls.

In use in coal fields the nation over for forty years, Wilmot crusher rolls are, through advanced engineering, again lowering the percentage of unwanted fines, meeting the increasingly exacting demands for uniform sizing, and bettering plant records for uninterrupted production.

Wilmot developments in precision, quick ad-

justability to meet changing requirements, and time savings in maintenance work have in no way affected their characteristic ruggedness. The compound-gear roll is so designed that: segment bolt shear is entirely eliminated; automatic relief is provided for the passage of foreign material; and ample provision is made at shaft and bed plates for top-load demands.

*Send for*

**NEW BULLETIN  
on Coal Crushers**

Bulletin R471 is a valuable reference on crushing data and crusher specifications that deserves a ready spot in your files.



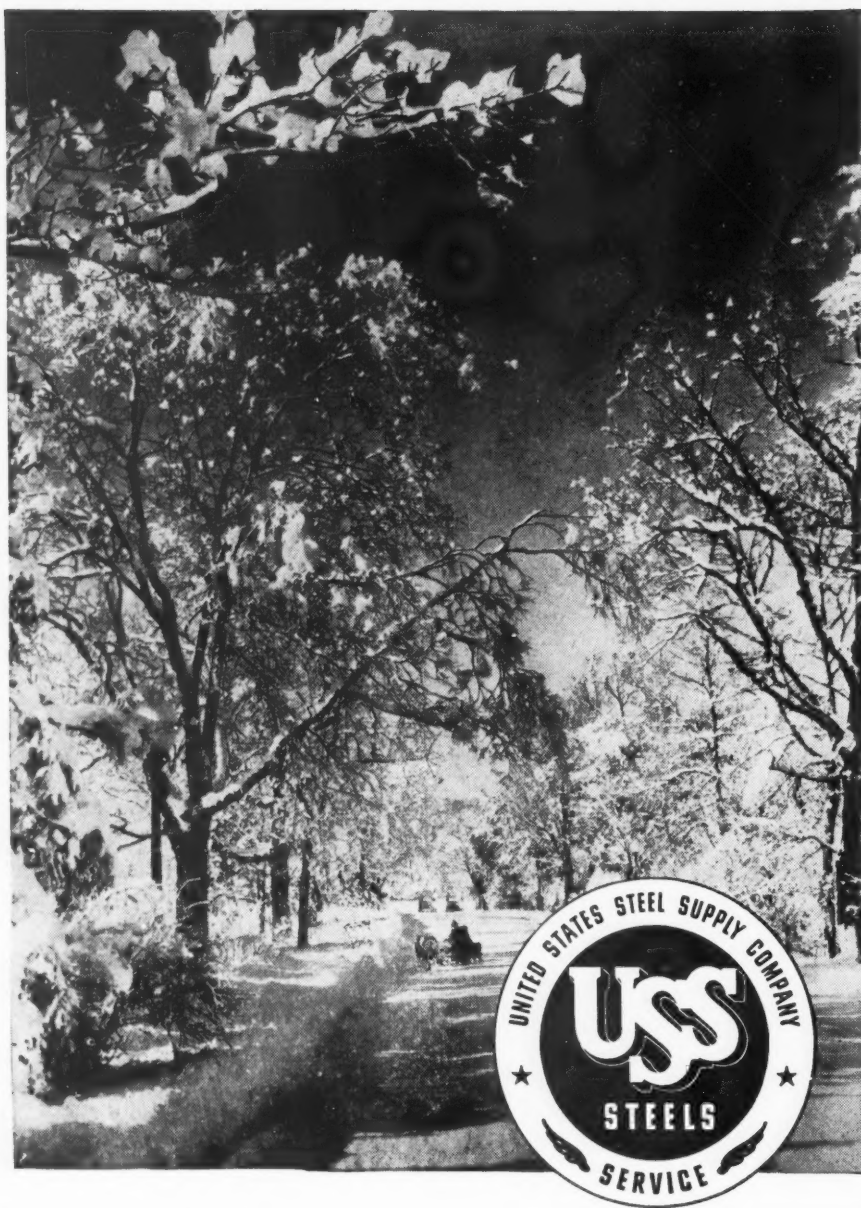
# WILMOT ENGINEERING CO.

HAZLETON, PA.  
Plant:  
WHITE HAVEN, PA.

**Wilmot Coal Preparation Equipment: Hydrotators • Hydrotator-Classifiers • Hydro-Separators • Simplex Jigs  
Crushing Rolls • Sizing Shakers • Bucket Elevators • Conveyors • Car Hauls • Keystone Rivetless Chain, etc.**

**WILMOT BUILDS BETTER BREAKERS**





## 1948—A year of promise

WITH the arrival of another Holiday Season, we find ourselves looking forward to 1948 as—A Year of Promise. This good feeling comes from the knowledge that the steel industry is already engaged in the greatest expansion program in its history.

The benefits of increased supply from added producing facilities will naturally be gradual, but we go into 1948 fully expecting to do a better job of taking care of your steel requirements.

We have already improved our facilities for service by erecting new modern warehouses in Cleveland and St. Louis. We have also opened a new warehouse in Los Angeles which will go a long way toward supplying the needs of steel users on the West Coast. And we expect to make other improvements and additions to our service facilities during 1948, so that our name will continue to be a "Symbol of Service" to steel users.

Meanwhile, we extend to you our cordial best wishes for a happy Holiday Season and a successful, prosperous New Year.

### UNITED STATES STEEL SUPPLY COMPANY

BALTIMORE • BOSTON • CHICAGO • CLEVELAND • LOS ANGELES  
MILWAUKEE • NEWARK • PITTSBURGH • ST. LOUIS • TWIN CITY (St. Paul)

# UNITED STATES STEEL

possible to effectively fight any type of fire that may be encountered. In addition, the carbon-dioxide can be used for ventilating purposes to clear away smoke and make approach to the fire easier." The gel material also is effective in making quick, temporary seal by applying it to brattice cloth.

Concluding his description of the unit, Mr. Bailey cited the following advantages:

1. It provides a ventilating means driven by carbon dioxide to drive the smoke and heat from the fire area.
2. It provides a sealing material effective in controlling and extinguishing deep-seated coal fires.
3. It provides carbon-dioxide for quick extinguishment of oil and electrical fires.
4. It provides a means of quickly constructing airtight temporary seals by spraying the gel over brattice cloth or other materials.
5. It provides a means of reducing or eliminating the possibility of an explosion in sealed-off areas by injecting carbon-dioxide.

Emphasis was rightly placed on the gel material in fighting mine fires, said Prof. Harold L. Walker, head, Department of Mining and Metallurgical Engineering, University of Illinois, in discussion. While good for gas and oil fires, carbon-dioxide, in spite of opinion to the contrary, is not so applicable to coal and wood fires because, among other things, of the possibility of producing carbon-monoxide, which is both toxic and inflammable. Carbon dioxide is, however, effective in diluting methane.

"Fine coal, being the least in dimension of the sizes usually made, also is the last to receive serious consideration from the cleaning standpoint," declared J. W. MacDonald, chief engineer, Old Ben Coal Corp., Christopher, Ill., in opening a discussion of cyclonic washing of fires. Production of very fine material, defined by Mr. MacDonald as minus 10- or minus 28-mesh from dedusting or dewatering, is increasing because of increased crushing and for other reasons. The minus 10-mesh material from dedusting or stoker-coal production totals nearly a tenth of the mine output on a normal basis of sizing, and is increased still more by crushing. With the usual dewatering screens ( $\frac{1}{2}$ -mm. slotted apertures), the total through them when new is about 4 to 5 percent of the tonnage hoisted. Worn screens increase the loss.

"Washery sludge, or the so-called minus 28-mesh fines, frequently will contain 30 to 50 percent of oversize as determined by sieve analyses. It also will contain about 10 percent or less minus 100-mesh material after loss of nearly half the very fine dust in the water wasted or passing to the clarification system. Sludge from washing a better than average coal has been found to carry around 85 percent of material which floats at 1.50 specific gravity. Assuming 80-

# 8 to 1

## THAT'S "TOOL STEEL" PROCESS PROVEN SUPERIORITY IN TIPPLE GEARING AND SPROCKETS

You can rely on "Tool Steel" tippie gearing and sprockets to keep your coal moving!

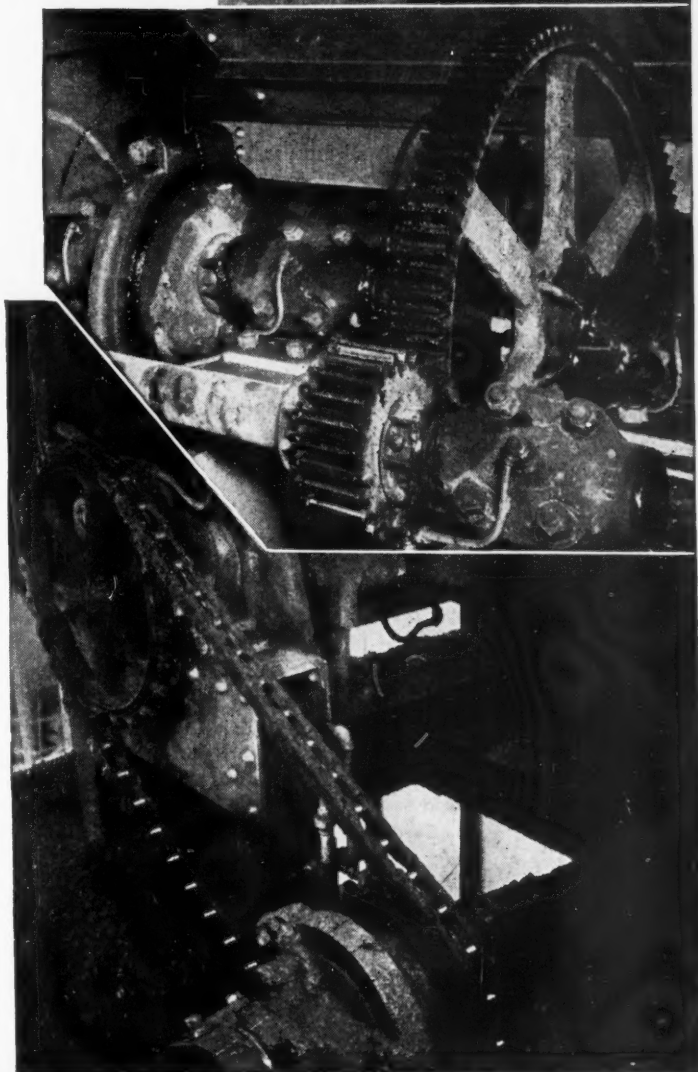
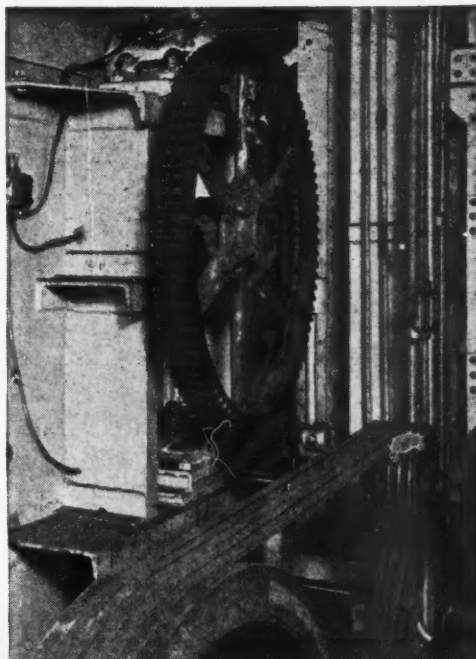
Every "Tool Steel" gear, pinion and sprocket is guaranteed to provide five times the life of ordinary untreated parts. But actual maintenance records everywhere prove that this service life, rises to and in many cases exceeds, a ratio of eight to one.

Here's why! "Tool Steel's" wearing surfaces are file hard—cores are soft and tough to provide maximum strength. So when you need tippie replacements, take advantage of "Tool Steel's" 8 to 1 superiority.

*Producers of*  
GEARS • PINIONS • SPROCKETS  
WHEELS  
*and other*

TOOL STEEL HARDENED PRODUCTS

Consult our catalog of coal mining machinery parts regarding items available for immediate stock shipment.



# THE TOOL STEEL GEAR & PINION CO.

CINCINNATI 16, OHIO



## "VIC" VICTAULIC SAYS...

**"No experience needed...and for tools—ONLY A 'T' WRENCH!"**

"When it comes to economy of labor and tools on piping system installations...you can't beat the 'two-bolt' simplicity of Victaulic COUPLINGS!

"There's no guesswork, no need to mark pipe. Victaulic Couplings center *automatically!*

"Also, Victaulic Couplings give pipe lines a *flexibility*...contours of buildings-or-land are followed with a minimum of bends and fittings, eliminating the extra cost of accurate alignment. And Victaulic Couplings won't pull out or blow off under pressure, vibration or sag!

"All this adds up to the fact that *inexperienced* workers can button up with speed and ease any piping system that uses Victaulic Couplings...and the only tool needed is a 'T' wrench!"

"So, if you want to save money and man-hours installing piping systems...make it VICTAULIC! And remember, Victaulic Full-Flow Tees, Elbows and other FITTINGS lower pumping costs and *increase delivery!*"

Write for new Victaulic Catalog and Engineering Manual

**VICTAULIC COMPANY OF AMERICA**  
30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

Victaulic, Inc., 727 W. 7th St., Los Angeles 14, Calif.

Victaulic Company of Canada, Ltd., 200 Bay St., Toronto 1

For export outside U. S. and Canada: PIPECO Couplings and Fittings:  
Pipe Couplings, Inc., 30 Rockefeller Plaza, New York 20, N. Y.

Have you considered Victaulic  
for your piping requirements?

Sizes— $\frac{3}{4}$ " through 60"

SELF-ALIGNING PIPE COUPLINGS

# VICTAULIC

EFFICIENT FULL-FLOW FITTINGS

Copyright 1947, by Victaulic Co. of America

percent recovery to provide a premium-grade product, it would amount to a better than 70-percent reduction of the general loss after allowance for slime wasted. Sieve analyses show the material to be substantially a 14- or 20x100-mesh product, due to inclusion of the slabby pieces which pass through a normally worn  $\frac{1}{2}$ -mm. slotted aperture.

"Cleaning this material is handicapped by the effect of particle size and shape, with consequent reduction in the rate of hindered settling. Augmenting the normal rate of precipitation by centrifugal force provides material advantage over the results obtained by gravity alone. This advantage, with consequent increased unit feed capacity, has reduced the principal difficulty in cleaning fine coal... The centrifugal force developed by spiral or cyclonic action provides sufficient increase in the settling or sedimentation rate to enable separation of fine material within a reasonably compact unit."

Most conical-type washing units provide advantage of centrifugal force, limited by the velocity of material passage, said Mr. MacDonald. "Fine-coal washing is improved by development of sufficient velocity to provide centrifugal force which more than offsets the reduced rate of precipitation due to particle size and shape." Three types of equipment using centrifugal force or cyclonic action presently available are the Humphreys spiral separator, the hydraulic sizer and the cyclone washer developed by the Dutch State Mines organization, using a suspension of loess in water.

Test operation with the Humphreys spiral separator on silt by The Hudson Coal Co. showed a recovery of 60 percent with an ash content of 18.2 percent, compared to 39.4 percent ash in the raw silt. Several tests showed that a combination of 32-percent refuse and 8-percent slime had an ash content of 70.5 percent. Tests also have been made on Illinois fines. Recovery was around 80 percent and the ash was approximately half that of the raw feed. With the hydraulic sizer, a test run on a middling product showed a reduction of over one-third in the ash content of the feed.

A conspicuous result of the tests with the cyclone washer is high capacity—up to  $3\frac{1}{2}$  t.p.h. in a cone about 8 in. in diameter and 12 t.p.h. in a 14-in. cone with a feed carrying 10-percent ash, yielding a 3.4 percent-ash cleaned coal with 51.3-percent ash in the reject. "Reported tests cover a feed-coal size from 0.5 to 3 mm., or  $\frac{1}{50}$  to  $\frac{1}{8}$  in., containing 25-percent undersize. Additional data cover operation with a feed input having a top size up to 15 mm., or about  $\frac{5}{8}$  in. Performance was equally good in the several reported tests and without appreciable reduction in efficiency from the particle-size range."

"A projected European installation," said Mr. MacDonald, "would remove



prem-  
amount  
duction  
owance  
s show  
y a 14-  
to in-  
which  
½-mm.

handi-  
le size  
duction  
t. Aug-  
ecipita-  
les ma-  
Its ob-  
advan-  
ed unit  
e prin-  
coal...  
ped by  
es suf-  
or sedi-  
aration  
sonably

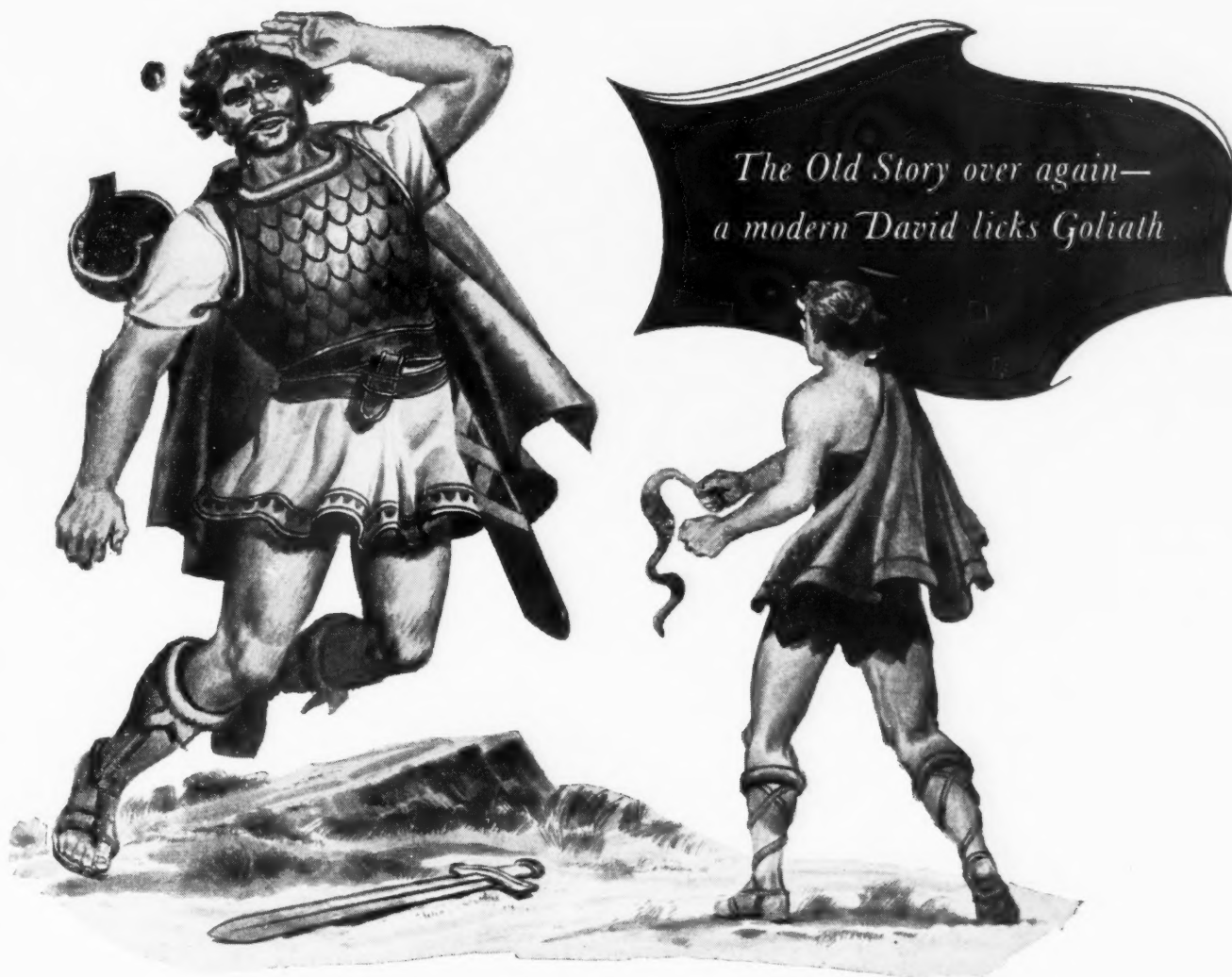
units  
rifugal  
of ma-  
Donald.  
ved by  
city to  
h more  
of pre-  
ze and  
ipment  
cyclonic  
re the  
the hy-  
washer  
Mines  
sion of

mphreys  
e Hud-  
very of  
tent of  
4 per-  
al tests  
32-per-  
me had  
t. Tests  
is fines.  
ent and  
alf that  
hydraulic  
product  
ne-third  
d.

ne tests  
igh ca-  
a cone  
12 t.p.h.  
arrying  
percent-  
cent ash  
cover a  
mm., or  
percent  
er oper-  
g a top  
in. Per-  
the sev-  
out ap-  
ey from

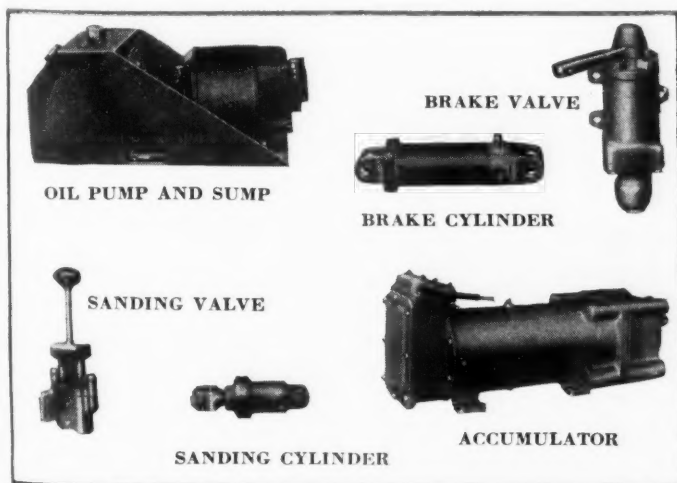
llation,"  
remove

COAL AGE



## WESTINGHOUSE HYDRAULIC BRAKE

### *for Mine Locomotives*



Certainly you can haul a lot heavier loads, at higher speeds, with your modern locomotives . . . but when you do, you've got some brand new braking problems to contend with. It takes a lot more power to stop a trip going 15 miles an hour than one traveling 12. On grades, the heavier loads produce Goliath forces that must be controlled.

There's a modern David to lick this Goliath, in Westinghouse Hydraulic Braking Systems. Parts are small and compact, fit into the unused crooks and crannies of your locomotives. Movement of the brake handle produces corresponding braking pressures, to slow or stop. Speed and accuracy of spotting is greatly increased, excessive maintenance caused by motor bucking is eliminated, operator fatigue is lessened, and safety is better served.

*Bulletin S. P. 9092 will give you details.*



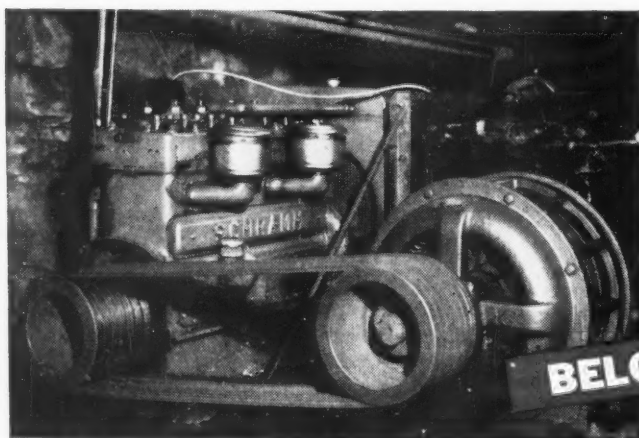
## WESTINGHOUSE AIR BRAKE COMPANY

INDUSTRIAL DIVISION

WILMERDING, PA.



Mining Engineers want ruggedness and dependability in an air compressor, portable or stationary . . . at the surface or down in the shaft. That's exactly what Schramm provides . . . plus four special features built into every Schramm Air Compressor: 1. 100% Watercooled, 2. Compact—Lightweight, 3. Mechanical intake valve, and 4. Forced feed lubrication.



Write today for performance and construction details on these rugged, dependable units. We believe Schramm compressed-air-power will help make your mining operations easier.



the minus 0.7-mm. coal before washing. Our need is concentrated within a product size which they will remove. It appears to require a media other than loess to facilitate convenient separation from the washed product. The excellent separating performance reported when using a media of loess suspension provides reason to expect control of the slime density should enable acceptable separation of fine coal without use of foreign materials for a media. Decanting would then suffice for the final separation of fine cleaned coal and the slime media. The encouraging results of operation with the hydraulic sizer indicate improvement is probable when using the cyclone washer design as developed in Europe.

"Improved future preparation of fine coal is needed to provide a product quality comparable with the larger sizes," Mr. MacDonald pointed out. "Sales realization should then equal or exceed the true value of the material as based on the cost of production. The present inequality from wasting the fines or disposal at low cost has necessitated a greater charge for the larger coals. Relief would be advantageous with respect to competitive fuels."

"The bulk of Illinois coal is consumed in Illinois, Arkansas, Missouri, Iowa, Nebraska, South Dakota, Minnesota, Wisconsin and Indiana," said Howard Herder, fuel engineer, Sahara Coal Co., Chicago, in a discussion of the demand for, supply and distribution of Illinois stoker coal. His paper opened the second session, presided over by J. G. Crawford, general manager, Valier Coal Co., Chicago. "The longest haul to market is about 1,000 miles for Illinois coal," Mr. Herder continued, "with freight rates up to \$5.50 a ton. However, most of the coal moves a considerably shorter distance and the freight rate probably will average under \$3 per ton."

From 1931 through 1946, Class 1 stoker sales totaled 1,073,886, or 80.59 percent of the total; Class 2, 127,498, or 9.57 percent; Class 3, 79,904, or 6 percent. About 25 percent of the Class 1, 2 and 3 stokers are installed in the Illinois market area, plus 16 percent of the Class 4 units and 13 percent of the Class 5. The agreed annual consumption is 11.5 tons for Class 1 stokers, 41 tons for Class 2 and 112 tons for Class 3. Extending these figures, the indicated demand for Class 1, 2 and 3 stokers in the Illinois market area is 6½ million tons, three million of which is needed for stokers burning less than 61 lb. per hour. These are primarily home stokers. To that 6½ million must be added two million tons for stokers larger than Class 3. "Although this represents the demand in the Illinois coal market area, this demand is not all met with Illinois stoker coal. Coal from Missouri, Kansas, Kentucky, Indiana and West Virginia also comes with this area."

In 1940, the computed demand for

**CLEAN, POSITIVE LUBRICATION OF 57 BEARINGS  
IN SECONDS ASSURED WHEN YOU INSTALL...7**

# LINCOLN

## CENTRO-MATIC LUBRICATING SYSTEMS



All 57 bearings on this Whaley "Automat" are lubricated by a Lincoln Centro-Matic Lubricating System. At left is a close-up of a few of the Centro-Matic Lubricant Injectors, each connected to a bearing by tubing or flexible high-pressure hose. At right is the Centro-Matic Lubricant Pump geared to the loading mechanism. Pump delivers a predetermined amount of lubricant through the injectors to each bearing while the machine is loading coal.

## *Save* BEARINGS . . . MACHINE HOURS MANHOURS . . . POWER and PREVENT ACCIDENTS

In coal mines where dust, dirt and moisture are prevalent, thousands of dollars can be needlessly wasted in lost production time, replacement parts, excessive maintenance labor, wasted lubricants, and injuries—quickly mounting losses that can be traced to faulty methods of lubrication.

These losses can be minimized, and production increased by installing Lincoln Centro-Matic Lubricating Systems on your mining machinery.

The Whaley "Automat," Mechanical Loader, shown above, illustrates how simple it is to equip mining machinery with these outstanding Systems. The System consists of a suitable lubricant pump; an injector of proper capacity for each bear-

ing; a single lubricant supply line connecting pump to injectors; and connections from bearing to injector made with tubing or flexible hose.

Lubricant pumps are available in manually, electrically, or air-motor operated models to meet the specific lubrication requirements of various types of machinery. Air and electrically operated pumps may be equipped with a time clock for full automatic operation.

TRADE MARK LINCOLN AND TRADE NAME CENTRO-MATIC REGISTERED U. S. PAT. OFFICE

# LINCOLN

*Pioneer Builders of Engineered Lubricating Equipment*

**Lincoln Engineering Company, St. Louis 20, Mo.**

Gentlemen:

Please send me complete literature on Centro-Matic Systems ☐. Have your representative call to discuss our lubricating equipment problem ☐.

Name \_\_\_\_\_

Firm \_\_\_\_\_

Address \_\_\_\_\_

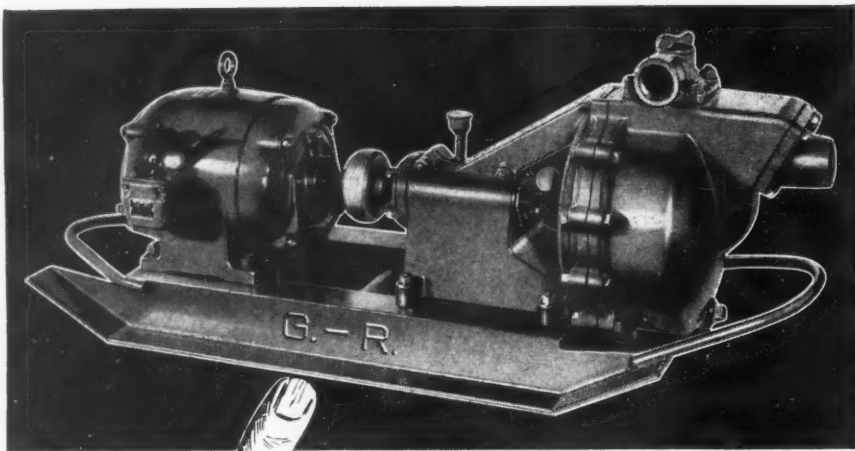
City \_\_\_\_\_

State \_\_\_\_\_

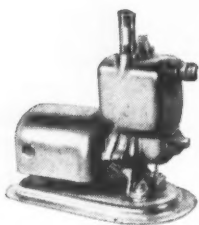
947-27

6A





## This Pump needs no nurse maid



Gorman-Rupp  
Mine Spray Pump  
ELECTRIC MOTOR  
DRIVEN model 1022—  
110/115 Volt AC of 60  
cycles or less or DC.  
Model 1022-M — 250  
Volt DC.

Mining requirements are tough. Rugged construction and reliable performance in a mine gathering pump is necessary. They must operate unattended for long periods of time.

Gorman-Rupp gathering pumps are designed to meet such requirements. They seldom need attention and are automatically self priming. They have primed perfectly through 200 feet of dry two-inch suction line. There is no adjustment between prime and run -- no valves or gadgets to rob pumping efficiency.

These pumps will not clog. They will handle any muck, sand or solids that will pass the intake strainer. The impeller, mounted on high grade roller bearings, is the only moving part. When maintenance is finally necessary, any wearing parts can easily be replaced by an inexperienced man with common tools. A quickly renewed wear plate greatly simplifies this operation.

Gorman-Rupp self-priming, centrifugal pumps are the most simple, rugged, *trouble-free units* you can buy and are ideal for automatic or remote control as well as for all regular water gathering service.

For additional information write for bulletin No. 301-46 or contact your nearest distributor.



**THE GORMAN-RUPP COMPANY**

306 BOWMAN STREET, MANSFIELD, OHIO

Distributed by: Guyan Machinery Co., Logan, W. Va. — Weinman Pump & Supply Co., Pittsburgh, Pa. — McComb Supply Co., Harlan, Ky. — Bittenbender Co., Scranton, Pa. — Industrial Supply Co., Terre Haute, Ind. — Hoe Supply Co., Christopher, Ill. — Central Supply Co., Greenville, Ky. — Ebbert & Kirkman Co., Inc., Birmingham, Ala. — Henszey Co., Watertown, Wisc. — Union Supply Co., Denver, Colo.

Class 1, 2 and 3 stokers was three million tons. "That means that demand has more than doubled in the past six years. The manufacture of stokers was curtailed the latter part of 1942 and released again early in 1945. In 1941, and again in 1946, stoker sales were just under 200,000 per year. About the first of this year, stoker sales took a dive and hit a low that compares with 1934 figures. No doubt, this decline was partly due to the short supply of suitable stoker coal. This curve has now turned and the rate of sale is about three times what it was in February, but still is only 50 percent what it was in 1946.

"The supply of stoker coal is inadequate . . . we have seen where the demand for stoker coal in our area has increased from three million tons in 1940 to 6½ million tons at the end of 1946. You men know how much you have increased the production of stoker coal during those years.

"It is not possible to get figures on the stoker-coal production of the entire State of Illinois. However, I think it can be conceded that the bulk of the specialty-prepared double-screened stoker coal comes from southern Illinois. Southern Illinois in 1946 produced about three million tons of this stoker coal with a top size of 1 in. or less. This size of coal could be applied to Class 1 stokers—those with a burning rate of 60 lb. per hour or less—and that three million tons would just match the calculated demand. But 1-in.-top-size coal also works very well in Class 2 and 3 stokers and they have to be fueled.

"The larger stokers also can use 1¼- or 1½-in. top sizes, but the production of these sizes was only one million tons in 1946. The total production, then, in southern Illinois of all double-screened stoker coals was four million tons and the demand for use in Class 1, 2 and 3 stokers alone was 6½ million tons. And don't forget that an estimated two million tons is needed for Class 4 stokers.

"The demand is no greater because the tonnage of stoker coal has curtailed the sale of stokers. With an adequate supply of suitable stoker coal, the increased demand would amount to 10 percent per year. Additional facilities for producing more stoker coal have been installed by many operators and a 15-percent increase in stoker-coal production is expected this year. However," Mr. Herder concluded, "the situation is not very good. The demand is there and will increase, and an increased supply must be forthcoming to preserve that business for the coal industry."

Asking if Mr. Herder's figures took in the demand to be expected from conversion from oil to coal as a result of the tight oil situation, Marc G. Bluth, executive secretary, Stoker Manufacturers Association, Chicago, declared in discussion that the stoker industry is trying to get users of double-screened coal to employ screenings, where possible, until demand is

three  
demand  
e past  
stokers  
of 1942  
45. In  
r sales  
year.  
stoker  
w that  
doubt,  
e short  
. This  
rate of  
it was  
50 per-

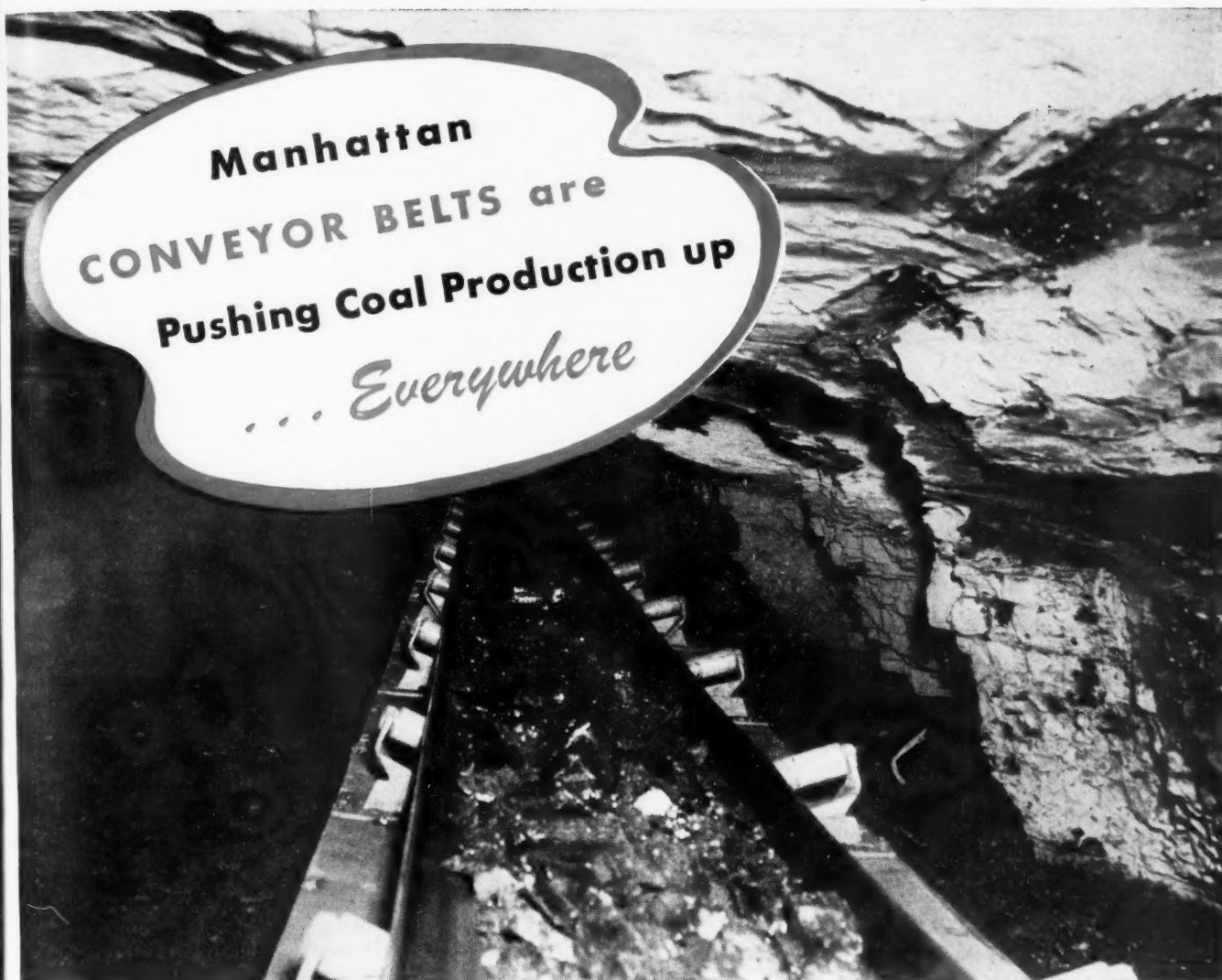
coal is  
where  
in our  
million  
at the  
w much  
tion of  
rs.

ures on  
the en-  
ever, I  
he bulk  
double-  
from  
inois in  
on tons  
size of  
al could  
—those  
er hour  
on tons  
ted de-  
al also  
and 3  
fueled.  
can use  
he pro-  
only one  
al pro-  
inois of  
als was  
and for  
s alone  
n't for-  
ion tons  
s.

because  
as cur-  
With an  
stoker  
would  
r. Addi-  
g more  
lled by  
cent in-  
on is ex-  
r. Herd-  
not very  
and will  
supply  
rve that  
y."

res took  
ed from  
as a re-  
n, Marc  
Stoker  
Chicago,  
e stoker  
users of  
screen-  
mand is

COAL AGE



The 26" wide, 48 oz. Manhattan "Master" Conveyor Belt shown here, is operating as a gathering belt. It discharges on a 30" Manhattan "Homocord" Conveyor Belt which conveys the coal to the tippie. This is the first 100% belt installation in the Birmingham district.

So, in the South, as in the North, the East and the West, you will find Manhattan belts are your best investment. As seams recede further into the earth and costs go higher, Manhattan conveyor belts are helping more and more mine operators to push pro-

duction up . . . to help coal meet the competition of other fuels.

Investigate Manhattan's complete range of conveyor belts. Ask particularly about HOMOCORD, the belt that troughs easily and takes terrific shock loads on a cushion of "rippling muscles" . . . and the remarkable new RAY-MAN, with Rayon Whipcord Strength Members—Manhattan's answer for the high tension of long lifts. A Manhattan Belting Engineer will study your problems with no obligation.



# RAYBESTOS-MANHATTAN INC.

*Keep Ahead with Manhattan.*

MANHATTAN RUBBER DIVISION

PASSAIC, NEW JERSEY





**They're plenty tough wet or dry!**

Streamlining your blasting operations with Seal-Tite Tamping Bags saves labor, speeds up shooting and reduces cost. Supplies of dummies are made up quickly and easily and are stored underground under humid conditions — and they're always handy and ready for use.



You'll be convinced when you see Seal-Tite Tamping Bags put to the severest of tests. They're even kept completely underwater for long periods. Then their tough chemically-treated, high wet-strength kraft is given the tear test in comparison with conventional bags. The safety-seam is submitted to pull-apart tests. You'll see for yourself and you're invited to make your own tests.

We'll send you samples of Seal-Tite Tamping Bags to try out — in the sizes you need — or in an assortment. Yours for the asking.

**Tamping Bag Co.**

**212 SO. THIRD ST.  
MT. VERNON, ILL.**



caught up. Whatever the mining industry can do to produce more stoker this winter would be most helpful, Mr. Bluth concluded.

The coal industry's job is to see that it remains an industry that capital has not and cannot forget, declared Joseph Pursglove Jr., vice president, research and development, Pittsburgh Consolidation Coal Co., Pittsburgh, Pa., in a discussion of the possibilities of liquid and gaseous fuels from coal. Progress is contingent, he stated, on much more than a solution of technical and research problems. The industry must embrace new concepts of its future role and must achieve a healthy financial status. Without that status, the industry will neither receive nor deserve public and financial regard.

There is an element of inevitability in coal's future. However, there still is a big question as to who will receive the rewards—coal, or somebody outside with greater vision or greater capacity to do the job. There are few other basic industries that confine themselves so closely to production only, with so little interest in the use of its product. This is not to say, Mr. Pursglove observed, that other large industries should not be based on coal use, but coal itself should have an interest in extending its jurisdiction of its product and should find it good business.

Coal's future as a solid fuel is a very real one—if for no other reason than because of the extra cost of converting it to some other form and then burning it for the same purpose. However, there are certain changes that seem inevitable, such as growing use in the production of chemicals. Improved mining methods, promotion of better utilization by the consumer and greater safety are essential. Meanwhile, the industry faces a situation where higher costs of developing properties accentuate the need for large coal reserves per property.

There still is hope for reversing the production-cost trend through more efficient production and better national labor relations. Certainly, said Mr. Pursglove, it is to be hoped that coal has learned what fire-sale prices and lack of planning mean. Real prices, taking everything into account, including expected added cost of building new properties in the future, benefit not only the operators of the present but also future generations. Some may feel that a buyers' market is just around the corner. Certainly, demand may ease off some years in the future. However, conversions to coal may be permanent because oil is more expensive and is harder to get.

Fuel for comfort and for energy have become subjects of keen public interest, as evidenced, among other things, by the public reaction to Pittsburgh Consolidation's announcement of its plans for producing liquid fuels and gas. Conditions in the oil industry — unprecedented demand,



# Your Everyday Piping Needs

## Now Filled from Local Stocks

**No waiting for most regular items at  
your Crane Branch or Wholesaler**

Stock bins are rapidly filling up at local Crane outlets. Day by day . . . in valves, fittings, steam specialties, and accessories . . . brass, iron, and steel . . . the selection keeps rounding out.

For routine maintenance work or emergency replacements . . . below or above ground . . . you're most likely to get what you need . . . when you need it . . . in the complete Crane line. Because in power, processing, or general service piping equipment, the Crane line is *most* complete. And because, in performance and value, Crane quality has always led the field.

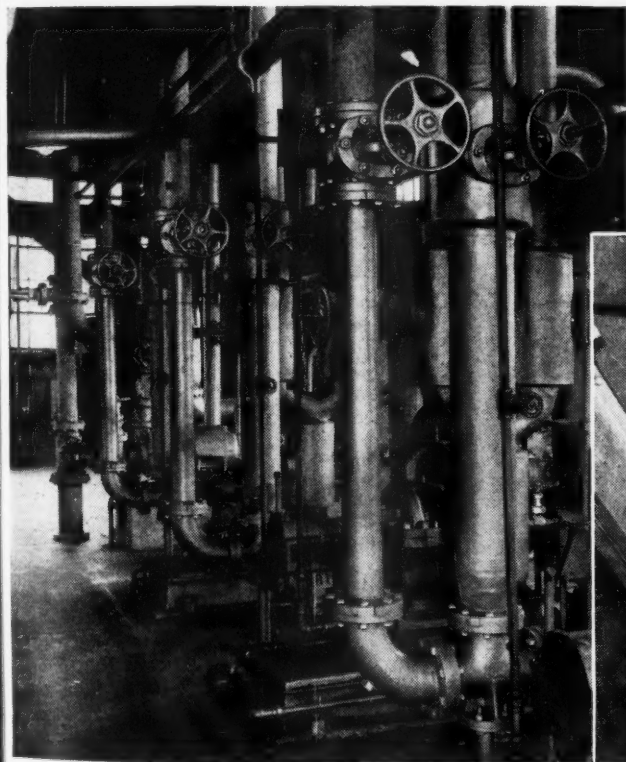
You'll avoid needless delays by calling your Crane Man first for everything in piping.

CRANE CO., 836 S. Michigan Ave., Chicago 5, Ill.  
*Branches and Wholesalers Serving All Industrial Areas*

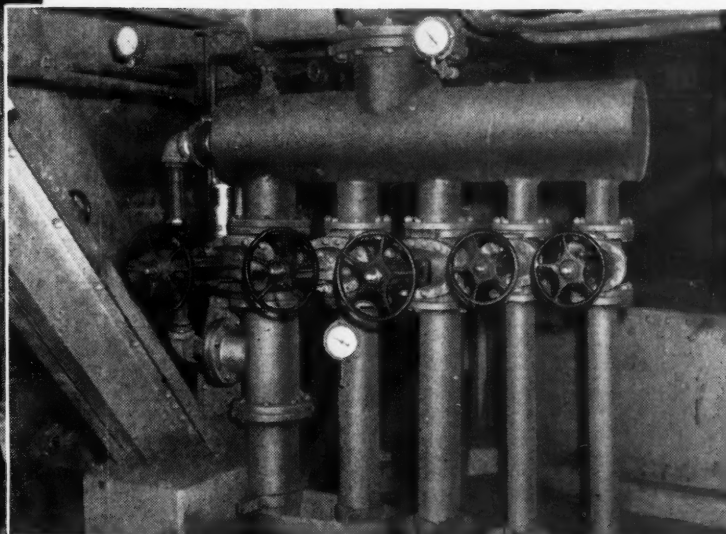
**ONE**  
SOURCE OF SUPPLY  
RESPONSIBILITY  
STANDARD OF QUALITY



**LIFTING WATER 1960 FEET** through a Crane-equipped piping system featuring 250-pound iron valves and fittings.



**A LARGE BREAKER PLANT'S** power house showing boiler feed piping, equipped from the complete Crane line.



**MANIFOLD TO PEA AND BUCK CONE** in breaker plant; also to agitator rings and classifier. One order to Crane gets all the piping materials.

**EVERYTHING FROM . . .**

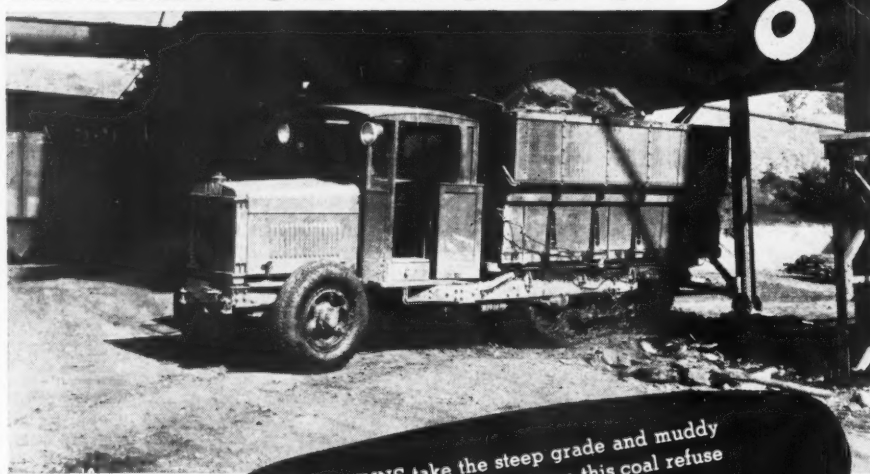
**VALVES  
FITTINGS  
PIPE**

# CRANE

**PLUMBING  
AND  
HEATING**

**FOR EVERY PIPING SYSTEM**

## HAULAGE COSTS UP ?



LINNS take the steep grade and muddy footing in their stride on this coal refuse disposal job at the Indian Head Colliery.

Meet your disposal and haulage schedules in spite of weather, severe grades or tough footing. None of these can stop the LINN HAFTRAK. LINNS work and earn every day throughout the year.

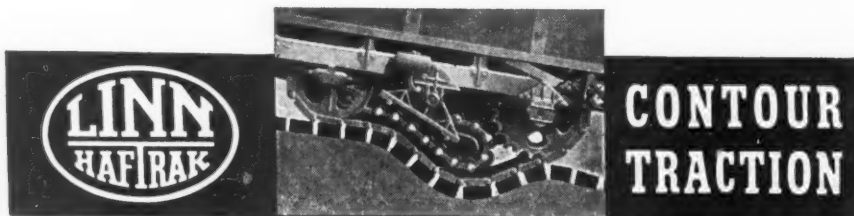
The answer to your really *rugged* haulage problem is a LINN. Its flexible traction unit always gets a toe-hold, its extremely wide tracks prevent "sinking in," it is a high speed unit and its rugged construction insures minimum repair and overhaul work.

For your next mine haulage job call on a LINN! LINNS are available with capacities from 5 to 50 tons in body styles to fit your requirements. For specifications write to our General Sales Office, 250 West 57th Street, New York 19, New York.

### THE LINN MANUFACTURING CORPORATION

MORRIS, NEW YORK

MANUFACTURERS OF HAFTRAKS FOR OVER 30 YEARS



CONTOUR  
TRACTION

higher costs of developing new supplies, and the high rate of exhaustion of reserves, with consequent upward pressure on prices—are adding to public interest. The problems of the natural-gas industry—particularly in meeting peaks—also are becoming increasingly difficult.

Making gas and oil from coal is nothing new, Mr. Pursglove continued. Pittsburgh Consolidation proposes to start by converting coal to carbon monoxide and hydrogen, which then are reacted together to produce gasoline, diesel and light oils, heavy oils, chemicals and methane. The goal is a generator that has an extremely high daily gas output compared to present equipment—and that will yield synthesis gas (carbon monoxide and hydrogen) at one-half to one-third present cost—or less. With such a gas, the plan is to get 84 percent of the liquid products as 80-octane, or better, gasoline, 6 to 7 percent diesel or light oils and the remainder heavy oils and chemicals.

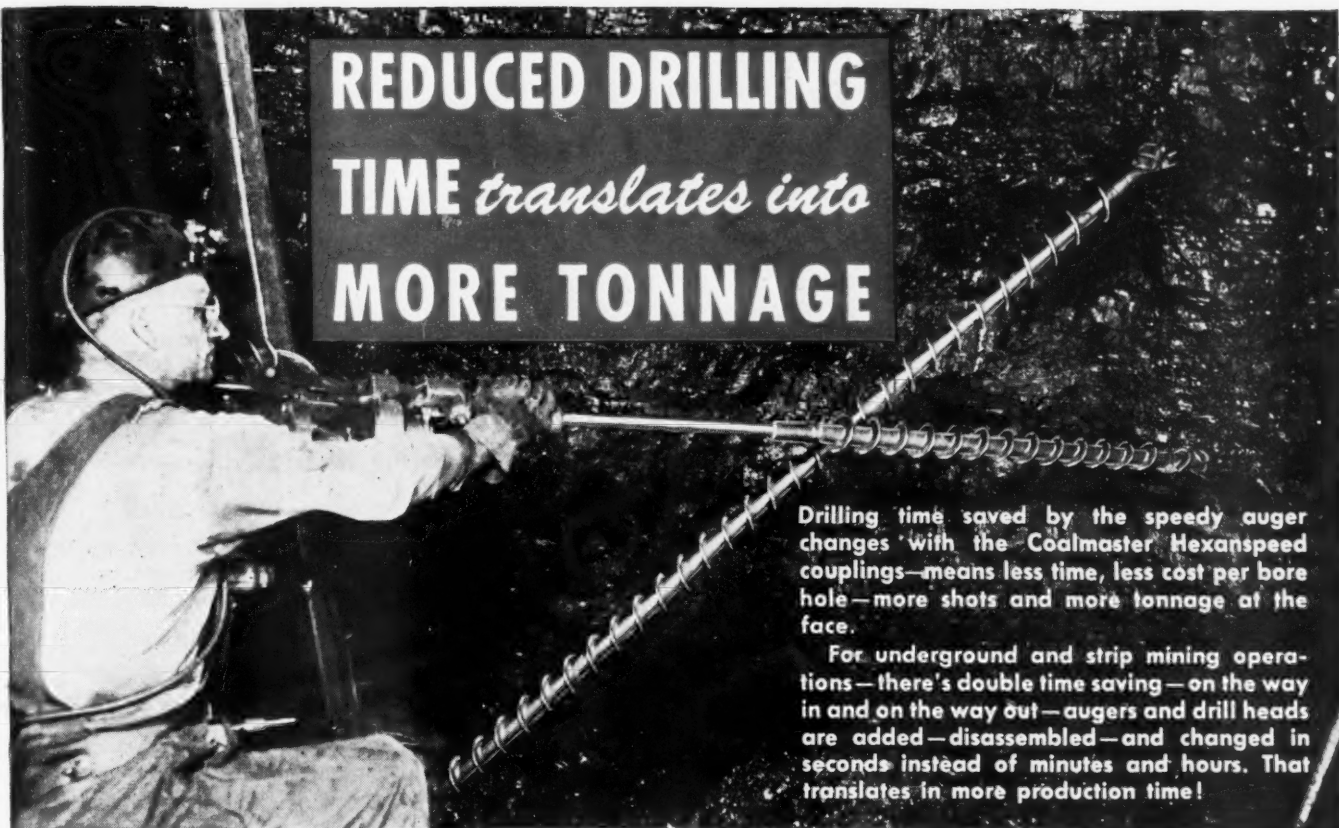
Methane also is produced and can be put back or sold. But with low present prices for natural gas, the problem is to compete on an economic basis. Since the return from gasoline and oil is much higher, the natural course will be to produce and sell those products, since the prices of competitive natural products are high enough that the producer of the synthetic products could come out in competition.

A contract has just been let by Pittsburgh Consolidation for a pilot plant to develop a high-volume low-cost gasification method, using coal as it comes from the mine with no further preparation beyond crushing. The company will not have to wrestle with converting the gas to liquid fuel, as that is a job already being done by oil and other organizations. The pilot plant probably will be built and in operation by May or June 1948, after which possibly one to three years will be required to achieve a commercially feasible result. If the answers can be found, then the industry will be ready to go ahead, remembering always that competition will be primarily with oil and natural gas and the feasibility of coal conversion, therefore, will depend upon the economics of those industries. In other words, getting oil from coal requires solving a number of big problems. An oil-from-coal industry will develop over the years but how fast depends on the price of oil, imports and so on, while with the present natural-gas prices, competition on any large scale does not look too possible at the present time.

Because conversion plants are terribly expensive, very large blocks of coal are necessary. Hauling coal imposes added costs and consequently the reserves must be at the plant. In addition, the plant must be near a large consuming area to reduce the cost of getting the product to the consumer and thus make competition



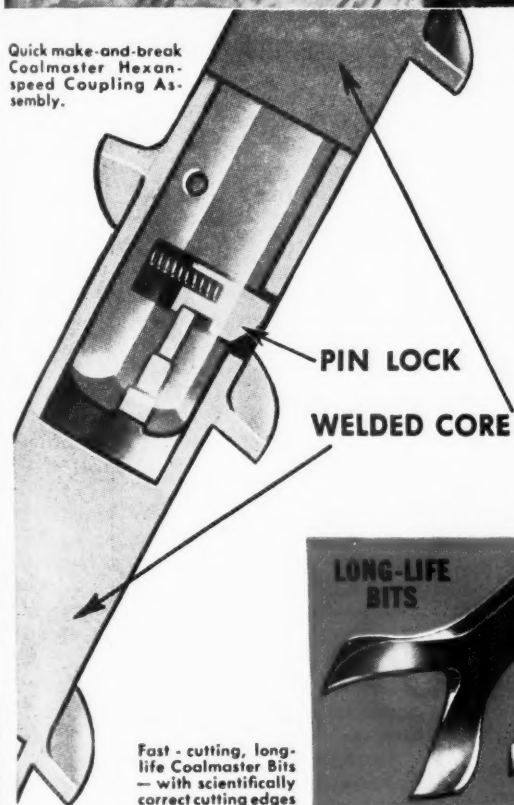
# REDUCED DRILLING TIME *translates into* MORE TONNAGE



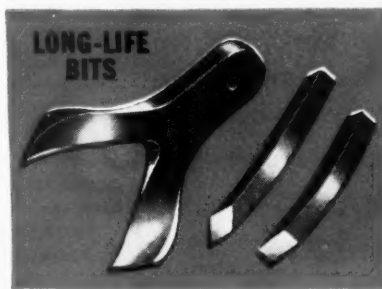
Drilling time saved by the speedy auger changes with the Coalmaster Hexanspeed couplings—means less time, less cost per bore hole—more shots and more tonnage at the face.

For underground and strip mining operations—there's double time saving—on the way in and on the way out—augers and drill heads are added—disassembled—and changed in seconds instead of minutes and hours. That translates in more production time!

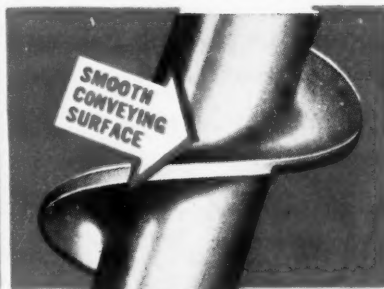
Quick make-and-break Coalmaster Hexanspeed Coupling Assembly.



Here's the time-saving, efficient Coalmaster Hexanspeed coupling in phantom view—to show the quick make-and-break feature that streamlines drilling operations. The hex shank with its pin-lock snaps right into the snug fitting hex socket—and the Spir-L-Weld flight of Coalmaster augers automatically fits flush and unbroken—on both drill head and auger couplings.



Fast-cutting, long-life Coalmaster Bits—with scientifically correct cutting edges and accurate bevel.



Coalmaster Auger—Spir-L-Welded for reduced flight drag and faster conveying.



**CENTRAL MINE EQUIPMENT COMPANY**  
ST. LOUIS 15, MO.

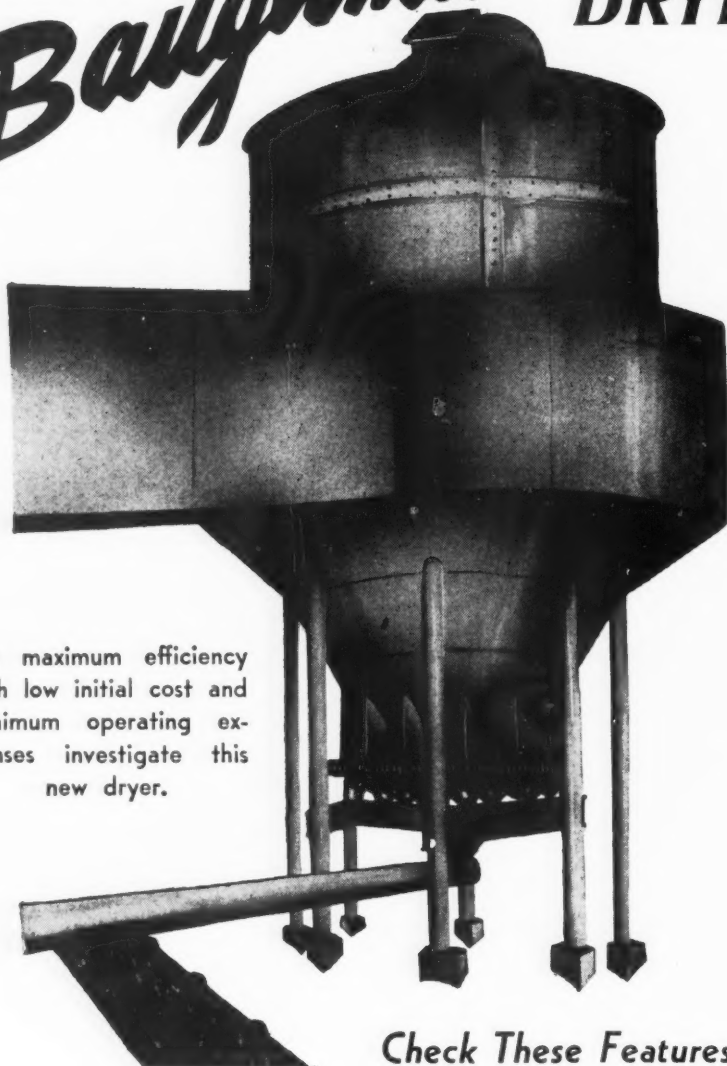
AUSTIN POWDER COMPANY, Cleveland, Ohio • BALIMO, LTD., London, England • BRITISH-AMERICAN INDUSTRIES, LTD., New York City, New York • THE BUDA COMPANY, Harvey, Illinois • DIAMOND SUPPLY COMPANY, INC., Evansville, Indiana • DOOLEY BROTHERS, Peoria, Illinois • ILLINOIS POWDER MFG. CO., St. Louis Missouri; Denver, Colorado; Salt Lake City, Utah • JOY MANUFACTURING COMPANY, Main Office: Pittsburgh, Pa., Subsidiaries and representatives in 57 countries • SALEM TOOL CO., Salem, Ohio



# NEW!

## Baughman

### VERTI- VANE DRYER



For maximum efficiency with low initial cost and minimum operating expenses investigate this new dryer.

#### Check These Features

1. Degradation of product is reduced to a minimum.
2. Slow movement of coal through unit makes possible use of low temperature gases.
3. Low temperature operation prevents overheated product.
4. Lower section of dryer acts as cooling chamber, giving cooler discharge of product.
5. Vertical construction requires a minimum of floor space.
6. Uniform drying without cataracting (smooth continuous flow) eliminates need of dust collectors.
7. No auxiliary equipment required for drying fine coal as fines may be left in product being dried.
8. High thermal efficiency proven by exhaustive tests means more dry product per B.T.U. burned for heat.
9. Low initial cost.
10. Low operating cost.

Write us for further information about Baughman Verti-Vane Dryers. Our sales and technical staffs are always ready to help you solve specific coal handling problems.

**ROBERT HOLMES AND BROS., INC.**  
DANVILLE, ILLINOIS

more feasible. Thus, in the light of present knowledge and costs, plants are not economically possible just anywhere.

To supply 1,000,000 bbl. of oil per day—about one-sixth the national total—would require the investment of seven billion dollars in conversion plants and new mines. For these and other reasons, the industry must expect to operate on an entirely new basis if it is to go into a liquid-fuel future, and especially if it is to embark on the new course of carrying its control over its product farther along the line toward the ultimate consumer.

#### NCA Establishes Safety Department

Establishment of a safety department, soon to be headed by an outstanding safety engineer, was announced by L. Ebersole Gaines, president, National Coal Association, at Washington, D. C., Nov. 8. Pointing out that the action was in accordance with instructions given by the board of directors at the NCA meeting in Chicago in October, Mr. Gaines hailed the new department as "a further move in the industry's progressive program for accident prevention and increased safety in mining operations."

Mr. Gaines also announced reappointment of the NCA safety committee, the chairman of which is L. C. Campbell, vice president, Coal Division, Eastern Gas & Fuel Associates, Pittsburgh. Other members include: D. H. Devonald, vice president, Peabody Coal Co., Chicago; Harry LaViers, vice president and general manager, South-East Coal Co., Paintsville, Ky.; J. B. Morrow, president, Pittsburgh Coal Co., Pittsburgh; Charles O'Neill, president, United Eastern Coal Sales Corp., New York; George H. Rupp, manager, mining department, Colorado Fuel & Iron Corp., Pueblo, Colo.; Henry G. Schmidt, president, Powhatan Mining Co., Cleveland; Paul L. Shields, vice president, United States Fuel Co., Salt Lake City; R. E. Snoberger, executive vice president, Binkley Coal Co., Chicago; and Herbert E. Jones, president, Amherst Coal Co., Charleston, W. Va.

Later, on Nov. 15, Mr. Gaines named members of two more committees, as follows:

Land Use Committee—chairman, R. L. Ireland, president, The Hanna Coal Co., Cleveland, Ohio; W. L. Burt, president, Greenland Coal Corp., Wheeling, W. Va.; R. R. Bowie, president, Bowie Coal Co., Grove City, Pa.; W. H. Cooke, president, Little Sister Coal Corp., Chicago; L. R. Kelce, vice president, Hume-Sinclair Coal Mining Co., Kansas City, Mo.; G. E. Nettels, vice president, Pittsburgh & Midway Coal Mining Co., Kansas City, Mo.; and R. H. Sherwood, president, Central Indiana Coal Co., Indianapolis, Ind.

Finance Committee—chairman, B

# 70%

of all mechanically-mined  
U. S. Coal is handled by machines  
with

## MOTORS built by RELIANCE



*They have to be better to enjoy such preference!* And mine operators everywhere will tell you that the rugged motors Reliance builds to meet the toughest operating conditions on coal-handling equipment are *outstanding* for their dependable and economical performance.

**RELIANCE ELECTRIC & ENGINEERING CO.**

1055 Ivanhoe Road



Cleveland 10, Ohio

Appleton, Wis. • Birmingham • Boston • Buffalo • Chicago • Cincinnati • Dallas • Denver • Detroit • Gary  
Grand Rapids • Greenville, S. C. • Houston • Kansas City • Knoxville • Little Rock • Los Angeles • Milwaukee  
Minneapolis • New Orleans • New York • Philadelphia • Pittsburgh • Portland, Ore. • Roanoke, Va.  
Rockford • St. Louis • San Francisco • Seattle • Syracuse • Tampa • Tulsa • Washington, D. C. • Sao Paulo, Brazil

# RELIANCE<sup>AC</sup> MOTORS<sup>DC</sup>

*"Motor-Drive is More Than Power"*

*Now*  
**33 1/3% to 50%  
 MORE STRENGTH  
 and LONGER LIFE!**

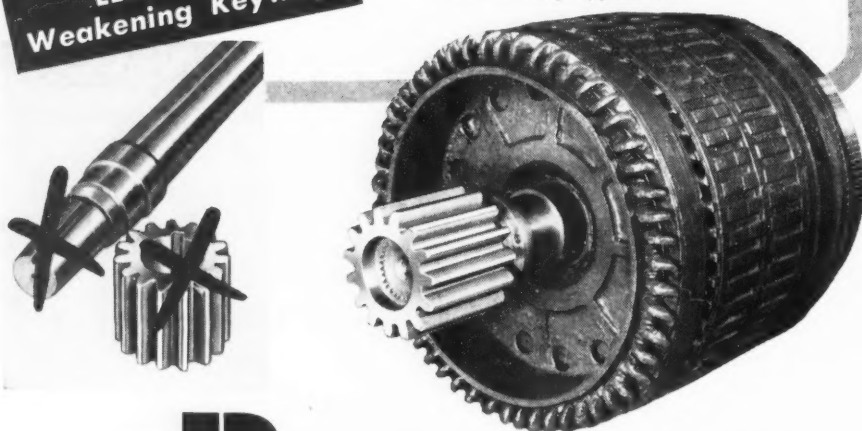


*Genuine*  
**PITTSBURGH GEAR**  
**TAPER SERRATED  
 SHAFTS and PINIONS**

Here's a proven way to cut work stoppages and reduce maintenance costs due to repeated breakage of shafts and pinions on locomotive armatures and other equipment exposed to tough going. Switch to GENUINE Pittsburgh Gear TAPER SERRATED shafts and pinions from old fashioned keyways and keys. They add 1/3 to 1/2 more strength and longer life by eliminating the cutting away of precious metal from shaft and under root of pinion tooth for keyways. Shafts and pinions are V-LOCKED together all around and can't shake loose — yet easy to apply or remove when necessary. See our distributor nearest you, or write us, for information on the applications of GENUINE Pittsburgh Gear TAPER SERRATIONS or other Special or standard replacement gears and parts for cutters, loaders, locomotives, etc. that give longer service and reduce maintenance.

**ELIMINATES  
 Weakening Keyways**

*Genuine Pittsburgh Gear TAPER SERRATED  
 shaft and pinion on locomotive armature  
 one of many applications.*



**PITTSBURGH GEAR**  
 AND MACHINE COMPANY | 27th & Smallman Streets  
 PITTSBURGH 22, PA.

**SPECIFY GENUINE PITTSBURGH GEARS**

H. Knode, president, Stonega Coke & Coal Co., Philadelphia, Pa.; O. L. Alexander, president, Pocahontas Fuel Co., Inc., New York City; Heath S. Clark, president, Rochester & Pittsburgh Coal Co., Indiana, Pa.; J. D. Francis, president, Island Creek Coal Co., Huntington, W. Va.; G. B. Harrington, president, Chicago, Wilmington & Franklin Coal Co., Chicago; and G. H. Love, president, Pittsburgh Consolidation Coal Co., Pittsburgh.

**Pennsylvania Coal Group  
 Fights Natural Gas Line**

Coal interests in Pennsylvania, representing the anthracite and bituminous industries, coke producers, railroads, retail-fuel merchants and labor groups employed by these industries, have organized the Pennsylvania Solid Fuel, Railroad and Labor Committee to fight approval of a new natural-gas pipeline from Texas to the eastern seaboard paralleling the present Big and Little Inch lines. The group will protest approval of the project before the Federal Power Commission.

The new committee is made up as follows: chairman, Mr. Earnest; secretary, Walter Jones, Central Pennsylvania Coal Producers' Assn.; Mart F. Brennan, president, District 7, U.M.W.A.; William Wyer, president, Central Railroad of Pennsylvania; John Whiting, president, Rainey-Wood Coke Co.; Graham Granger, assistant vice president, Eastern Gas & Fuel Associates; and Roger B. Jones, past president, Pennsylvania Retail Coal Merchants' Assn.

**Mine Fatality Rate  
 Dips in September**

Accidents at coal mines in the United States caused the deaths of 60 bituminous miners and 14 anthracite miners in September, 1947, according to reports furnished the U. S. Bureau of Mines by state mine inspectors.

For the two industries combined, in producing 57,486,000 net tons, the preliminary fatality rate in September was 1.29 per million tons, somewhat less than the latest figure of 1.41 for August, 1947. The preliminary rate for September, 1946, was 1.30, later revised to 1.45.

With a production of 52,350,000 tons, the preliminary bituminous rate was 1.15 per million tons in September, 1947, as compared with the latest figure of 1.35 for August, 1947. The preliminary rate for September, 1946, was 1.14, later revised to 1.30.

The preliminary anthracite fatality rate for September, in mining 5,136,000 net tons, was 2.73 per million tons, as compared with the latest August rate of 2.00. The preliminary rate for September, 1946, was 2.98, later revised to 2.97.

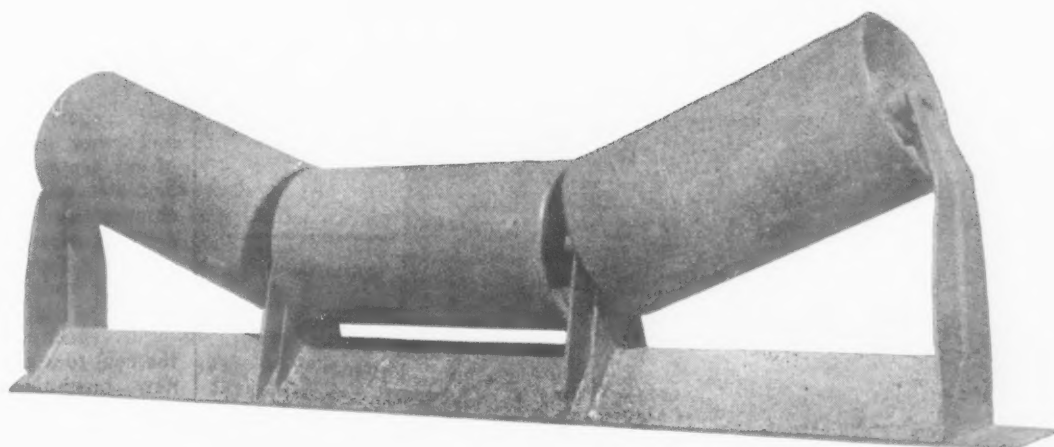




*You never have to oil*

## KREMSEY CONVEYOR EQUIPMENT

*yet you always get  
strength and  
trouble-free operation!*



**Kremser's IDLER** requires no greasing for the life of the bearing . . . only one of many features of this new improved all steel welded conveyor idler.

Today this **Kremser** equipment is being used for heavy conveyor duty because of its many points that save dollars in service and maintenance. The quadruple neoprene sealed, pre-

greased ball bearings have no maintenance problems.

When you are ready to buy Conveyor Equipment it will pay you to consider the cost-saving advantages of **Kremser**. Complete conveyors engineered to your needs. To get full details of **Kremser** equipment write us today.

**KONVEY THE  
KREMSEY WAY**

**FRANK A. KREMSEY AND SONS, INC.**

MANUFACTURERS OF

HEAVY DUTY BELT CONVEYORS AND MACHINERY FOR QUARRY, MINES AND PITS

3435-45 NORTH 5TH STREET, PHILA. 40, PENNA.

1 2 3 4 5 6 7 8 9 10

## NOW — the only 10-Shot Permissible MAGNETO

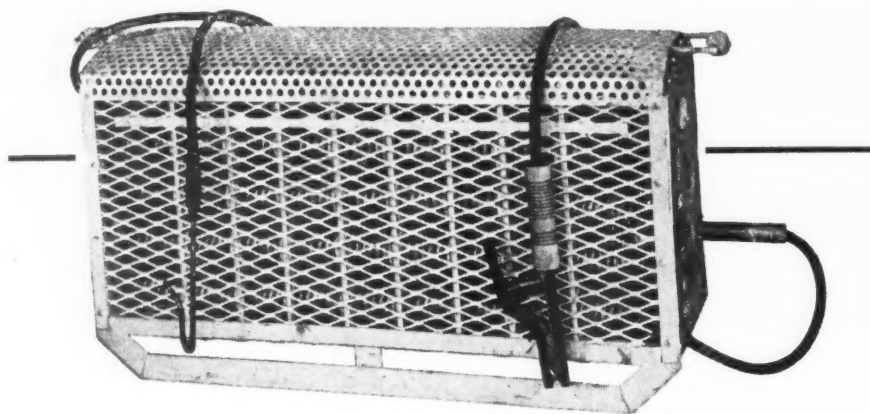
**For SAFE BLASTING in  
Gassy or Dusty Mines**

The new Breeze Blasting Magneto is the **ONLY** Permissible 10-shot blasting machine available. **SAFE** because discharge is limited to between 12 and 30 milliseconds by automatic switch at peak voltage—a secondary explosion cannot occur. More than enough energy is produced to fire 10 electric blasting caps in series. Corrosion-resistant, splashproof construction and permanent lubrication means reliability and long life. The Breeze Magneto is pocket sized—only 3"x 4 1/4"x 3 1/2", weighs just 4 1/2 pounds. Orders now being accepted for early delivery.

**BREEZE** ANOTHER **BREEZE** PRODUCT  
CORPORATIONS, INC.

41 South Sixth Street, Newark 7, New Jersey

**PERMISSIBLE  
TEN SHOT BLASTING UNIT  
APPROVAL NO. 1602**  
ISSUED TO  
**BREEZE CORPORATIONS, INC.**  
**CAUTION**  
NOT PERMISSIBLE UNLESS USED BY an  
authorized person within its rated capacity, with rubber covered  
wiring wire not smaller than No. 18 B & S gauge and not more  
than 5 ohms total resistance.  
CAPACITY Ten electric blasting caps with 30 ft. copper  
leg wires or 60 ft. iron leg wires (maximum).



*easy to move . . . easy to use*

The G.M.C. Portable Arc Welder can be brought to the job, hooked up, used and moved out easily and quickly. Handles are located conveniently AWAY from the unit to cool off. Coils are protected from all sides and the unit is sturdily constructed to take hard use. If you are looking for a practical PORTABLE Arc Welder this is the answer!

**G.M.C.**  
*Portable*  
**ARC  
WELDER**  
for 250 or  
500 Volt D. C.

**GUYAN MACHINERY CO.** LOGAN  
WEST VA.

## British Miners' Leader Sees 1948 Exports Upped

Britain will be able to export 10,000,000 tons of coal in 1948, in the opinion of Arthur Horner, Communist president of the National Union of Mine Workers. However, Mr. Horner did not say how this would be achieved and another high union official contended that there will be practically no coal—only “a dribble”—for export because of the falling off of manpower. Both the mine-union president and his fellow official expressed their opinions in interviews with McGraw-Hill correspondents in London.

About one-third of the miners had started overtime work by the middle of November, Mr. Horner stated, and were working either half a day on Saturday or an extra half hour per shift. The five-day week has not lowered coal production, he contended, but when asked if increased manpower was not responsible for the slight increase this year, he admitted that it was. As for frequent local stoppages, Mr. Horner pointed out that all but one—the Grimethorpe strike—had been stopped by intervention of top union officials and declared that walk-outs had not seriously hurt the year's production.

For manpower and mechanization problems, Mr. Horner had no solution. “Mechanization is not the answer under present conditions,” he said. “In the first place, the pits are not laid out properly for conveyors, cutters and other modern machinery. Many of our seams are too thin for machinery. Secondly, in those pits where machinery can be used . . . we cannot get delivery of equipment in less than a year. . . . Furthermore, our manpower position today, when every man is needed to dig coal, does not permit us to divert any men from getting out the coal to a different job of installing new machinery and starting new methods,” he concluded.

Little hope was held out for increased production for export by Mr. Horner's fellow union official, who cited the shortage of coal cars, inability to mechanize immediately, exhaustion of manpower sources among Poles and D. P.'s, and the annual depletion of manpower due to old age and disability as reasons for his pessimism. “The only way we can keep up manpower from now on,” he declared, “is to raise wages for the miners and make the job so attractive that we will not only stop men quitting but will attract more young Englishmen from various sources into mine work.” Speaking of training for Poles and D. P.'s, this official pointed out that most of them had to be taught to speak rudimentary English—a matter of six weeks or so—before even starting their mine training and that this training must be followed by a six-weeks' course in mining methods.

Mr. Horner stated that after De-



# B-Z ROUND BAR SCREEN LIVES A *Longer Life*

## Time Makes These Bars Tougher

B-Z Round Bars are made from special stainless steel alloy — abrasion and wear makes them even tougher. Rust proof, too!



## Never Blinds, Even With Age

B-Z Screens are a masterpiece of precision. Openings are uniform. Full length Round Bar design improves efficiency, avoids blinding.



## Put Together To Stay Together

Supporting cross rods are welded to bars—at every cross point. Rigidity and lasting strength is a B-Z feature.

It costs less to use B-Z Round Bar Screen. The reason is simple. B-Z Screens are built to last. Dollar for dollar, you'll process more tonnage, reduce shutdowns and increase the efficiency of your sizing, dewatering and drying operations.

Longer life is a part of B-Z Screen design. Round bars maintain the same size openings even when screen is 50% worn. Stainless steel bars are welded to cross rods at every point of contact. From such quality comes longer life—and lower screening costs.

B-Z Round Bar Screens can be engineered to fit your plant—in any size, opening or shape. They are flexible in design—can be built to perform a particular job or produce any desired result.

Write for catalog.

**50% WORN..YET  
100% EFFICIENT**



Famous B-Z Round Bar design works like this—top half of bar can wear away yet opening size is unchanged. Longer screen life—longer efficiency results!



**BIXBY • ZIMMER**  
**ENGINEERING CO.**  
961 Abingdon St. • GALESBURG, ILL.





In a mine electrical distribution system, properly sectionalized with I-T-E Type KSC Automatic Reclosing Circuit Breakers, electrical disturbances in one section cannot affect service in others. Production continues—and productive machinery is protected against careless abuse.

The only circuit breaker specifically developed for the mining industry, the KSC is a rugged, dependable unit of protection. It is compact, readily portable, and flexible in operation to meet fluid mining conditions. The KSC operates on circuits which can be fed in either direction; opens quickly at first sign of short or overload—recloses automatically on a return to normal line conditions. Hazards of fire and explosion are kept to a minimum, and safety to personnel and equipment is assured.

When properly applied in sectionalizing, the KSC prevents

short circuits from being fed by distant substations, and quickly separates substations when disturbances occur. Production in some mines has actually been increased by more than 10% through KSC's localizing trolley and feeder disturbances to the limited areas in which they occur.

*The I-T-E representative in your locality can give you complete information on the I-T-E Type KSC Automatic Reclosing Circuit Breaker. He is also fully qualified to assist you in planning the sectionalization of your mine. Use his services without obligation.*

**I-T-E CIRCUIT BREAKER CO.**  
19th & Hamilton Sts., Philadelphia 30, Pa.  
31 OFFICES IN UNITED STATES & CANADA

**BE PRODUCTION-WISE . . .  
Sectionalize**



**S-E-C-T-I-O-N-A-L-I-Z-I-N-G  
SWITCHGEAR**  
The Leader In Technical Excellence

SWITCHGEAR • UNIT SUBSTATIONS • AUTOMATIC RECLOSING CIRCUIT BREAKERS

cember he will not go along with the government's recent order tying miners, agricultural workers, steel workers and others to their jobs and will demand that mine workers be exempted from the order. Under this order, which Mr. Horner had agreed to until December, a miner who quits his job may be denied a new job by the government.

Mr. Horner also said that his primary loyalty is to his union and not to the government. "My job is to sell labor at the highest prices I can get," he stated. "In the old days I tried to get as high wages as I could for the men out of the mine owners. Now I try to get as much for them as I can out of the government. There is a feeling among some of the miners that the Coal Board is their Coal Board and they are a part of it because it is made up of members of the Labour Party. But I don't take this attitude. My job is to get as much as I can for the men in wages, improved health and safety measures, better food and living conditions."

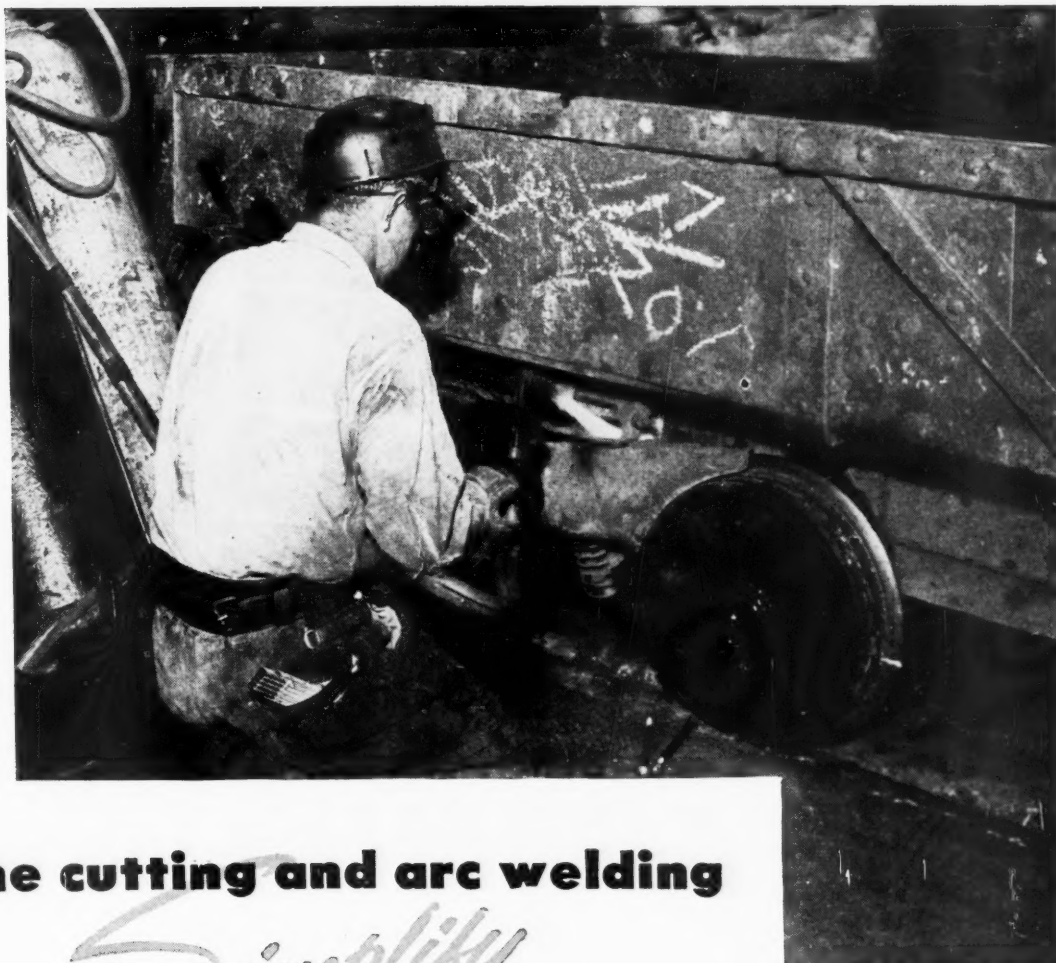
## Consol (Ky.) Opens New Portal Near Jenkins

Portal improvements costing more than \$150,000 at No. 204 mine of the Consolidation Coal Co. (Ky.) were opened to miners and the public at ceremonies at Marshall's Branch, near Jenkins, Ky., Oct. 24. More than 2,000 people attended the celebration. The new portal facilities include showers, toilet conveniences and drinking fountains for 500 to 600 employees. Bathhouse floors are of red non-skid concrete and walls are of buff glazed tile. Other portal buildings house supplies, repair shops, a lamp house, first-aid quarters and administration and engineering offices. Parking space for 150 automobiles has been provided. A new building to be occupied by the Champion Stores, Inc., is equipped for a modern grocery, meat and provision department, a lunch counter and a soft-drink fountain. A filling station will serve automobiles belonging to miners, their families and officials of the company.

## Chicago Utility Will Use Cyclone Coal Burner

Cyclone coal burners instead of conventional burning equipment will be installed on all new additions to the generating capacity of the Commonwealth Edison Co., Chicago, according to an announcement made recently. First major installation will be at the Fisk station, where a new 150,000-kw. turbogenerator will go into service in 1949. The company decided to use the cyclone burners following success of a pilot installation in 1943 in the Calumet station.

The cyclone burner, designed to



## Flame cutting and arc welding

*Simplify  
Maintenance*

Laborious, time consuming colliery maintenance jobs can now be performed quickly and at low cost with the oxyacetylene flame and electric arc.

Typical examples include: reclamation and repair of worn motor cases by welding resulted in a saving of several thousand dollars for one colliery. In another, a skeleton-type frame for a six-ton locomotive, which had been fractured in four places, was repaired by arc welding.

For repair work on mine-car bodies old bolts are easily removed with a cutting torch. Damaged car sections can be cut away, new sections fabricated on flame cutting machines and are welded into place. Bent members can be straightened by flame heating.

These are just a few of the many profitable Airco oxyacetylene flame and electric arc applications in and around mines. Others include

welding of rail ends to form one continuous rail . . . flame hardening of machine parts . . . rebuilding of worn surfaces . . . hard facing of equipment subjected to wear . . . and numerous other repair jobs.

**For further information about these cost-cutting, time-saving processes write for the explanatory article — "Welding, Flame Cutting for Efficient Maintenance and Low Cost."**

Address: Dept. CA-6122, Air Reduction, 60 East 42nd St., New York 17, N. Y. In Texas: Magnolia Airco Gas Products Company, Houston 1, Texas. Represented Internationally by Airco Export Corporation.



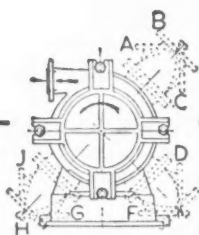
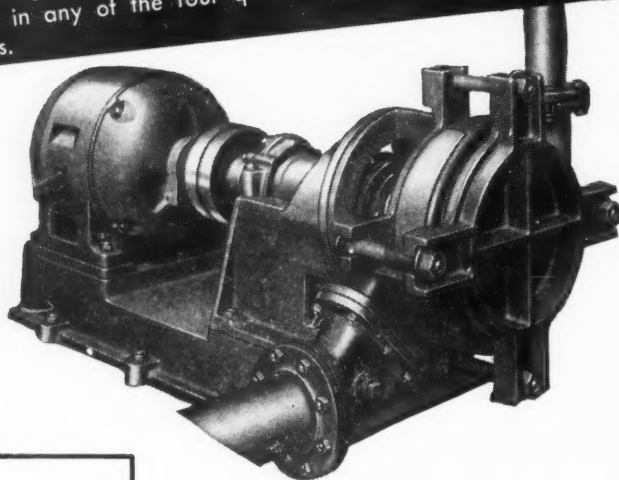
## AIR REDUCTION

*Offices in All Principal Cities*

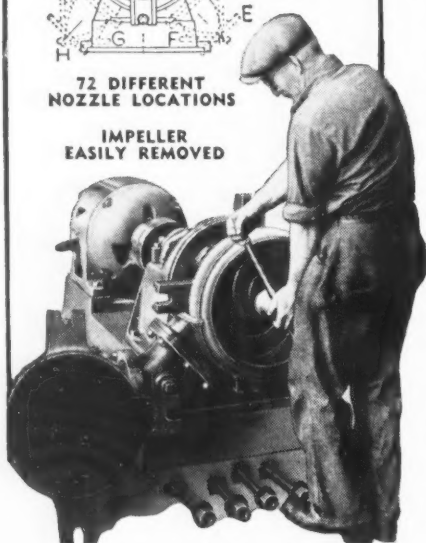
HEADQUARTERS FOR OXYGEN, ACETYLENE AND OTHER GASES...CARBIDE...GAS WELDING AND CUTTING APPARATUS AND SUPPLIES...ARC WELDERS, ELECTRODES AND ACCESSORIES

## Only the NEW TYPE "R" MORRIS SLURRY PUMP has these 4 FEATURES!

1. The gland is under suction pressure only. This feature practically eliminates packing troubles.
2. For dismantling, you need remove only four bolts. The Type "R" Morris has no internal studs or bolts . . . no troublesome fits or joints.
3. You can remove the impeller and liner without disturbing piping.
4. Shell interchangeable for right or left hand rotation. Suction and discharge nozzles can be rotated around axis of pump to positions in any of the four quadrants, a total of 72 combinations.



72 DIFFERENT  
NOZZLE LOCATIONS  
IMPELLER  
EASILY REMOVED



### And They Add Up to These EXCLUSIVE ADVANTAGES

- EASY TO INSTALL!
- EASY TO DISMANTLE!
- EASY TO MAINTAIN!

The New Type "R" Morris Pump—the most advanced design in the pump field—is specifically engineered to handle ore concentrates . . . tailings, slag and residue from filters and classifiers. Operates on all types of caustic or acid mixtures containing abrasives or solids.

Write us for specification and operation data on pumps best suited to your particular needs. No charge or obligation.

MORRIS MACHINE WORKS, Baldwinsville, N. Y.  
Sales Offices in Principal Cities

**MORRIS**

**CENTRIFUGAL PUMPS**

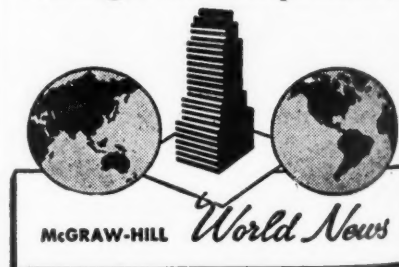
burn central Illinois coal, is said to have the following advantages: (1) from 80 to 85 percent of the ash is collected in the furnace and removed in molten form, simplifying ash handling and reducing dust emission; (2) retention of ash in the furnace reduces boiler-tube cleaning and permits closer spacing of tubes; (3) costly precipitator equipment to remove fly ash is not needed; and (4) simple, easily maintained coal-crushing equipment can be substituted for expensive pulverizers.

The cyclone burner at the Calumet station is a horizontal cylindrical chamber 8 ft. in diameter and 11 ft. long. It is closed at one end, except for coal and air inlets, and has a restricted discharge opening at the other end. Coal crushed to ¼-in. is introduced into the compartment with air at a velocity of 300 m.p.h. The resulting cyclonic motion results in split-second burning. In the new Fisk generating unit, two boilers, each fired by four burners, will supply steam with a capacity of 750,000 lb. per hour per boiler.

### Appalachian Coals Inc. Books Coal Newscasts

The facts about coal and its part in the national economy soon will be broadcast over about 75 stations, mostly those of the Mutual Network, under the sponsorship of Appalachian Coals Inc., Cincinnati, Ohio. Action to inaugurate the 52-week series, involving 5-minute broadcasts five days a week, was taken by the board of directors Oct. 15 and was approved unanimously by stockholders Oct. 28. The broadcasts, scheduled to be started at an early date, will be designed to improve the relations among the industry, its employees and the public and will be a major part of a far-reaching public relations program that will enlist newspapers as well. The broadcasts will be built about the top news of the day, including news items about coal and the coal industry.

### Foreign Developments



Canada—A board of conciliation set up by the Labor Department of the Saskatchewan government has recommended unanimously that the demand of the U.M.W.A., District 18, for a welfare fund levied on production in

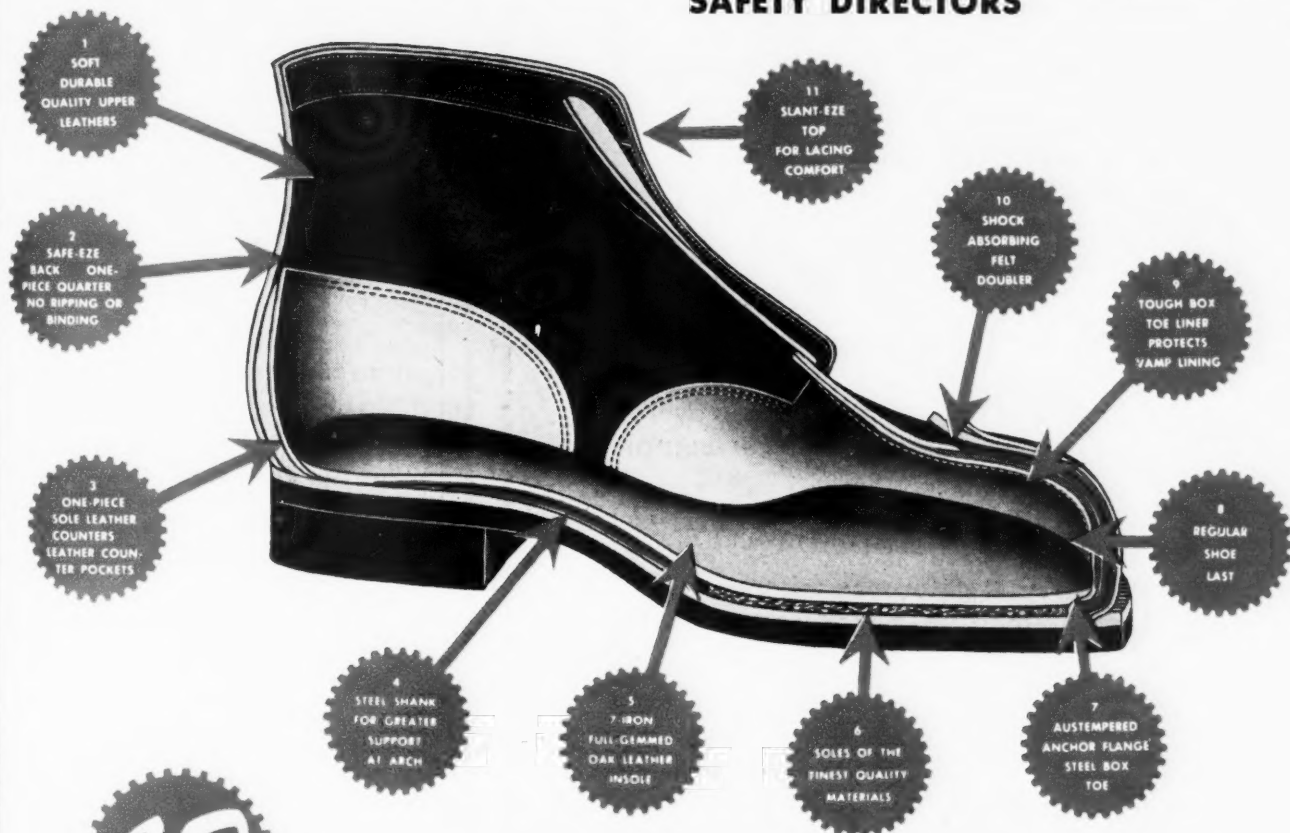




# 12 Reasons Why

## HY-TEST Safety Shoes

ARE FIRST CHOICE OF AMERICA'S LEADING  
SAFETY DIRECTORS



FULL RANGE OF SIZES, TYPES AND STYLES  
FOR EVERY SAFETY NEED

**...Insure Workers Feet  
In Sure Protection**

50 DIFFERENT TYPES

9 DIFFERENT KINDS OF SOLES

WIDTHS AA-EEE, SIZES 5-15

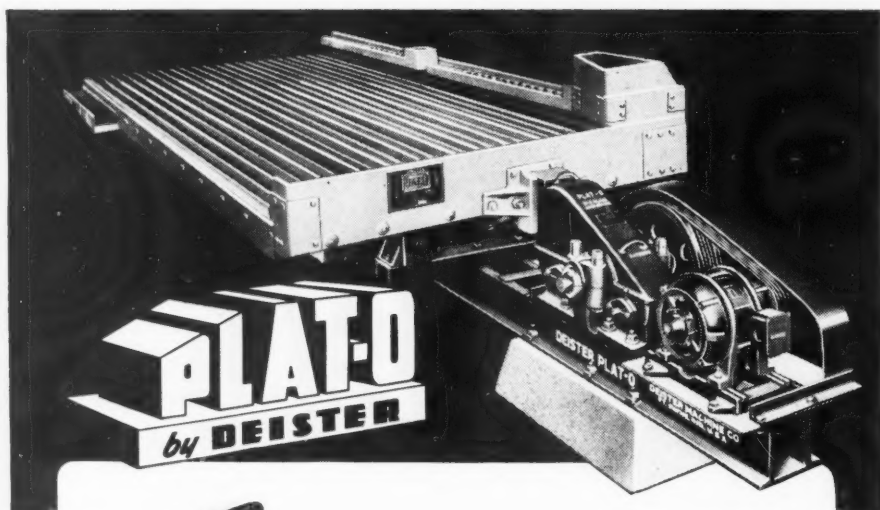
5 LASTS (Dress & Work)

WELT AND NAILED CONSTRUCTION

## HY-TEST Safety Shoes



HY-TEST DIVISION • INTERNATIONAL SHOE COMPANY • ST. LOUIS 3, MISSOURI • EASTERN OFFICE • MANCHESTER, N. H.



## Save Marketable Coal

Production-wise coal operators are salvaging marketable coal by reclaiming the "fines" from their waste piles. With the installation of Plat-O Coal Washing Tables you too can obtain maximum recovery of coal that would otherwise be a complete loss.

With Plat-O Tables you get complete recovery of the smallest sizes . . .  $1/16"$  x  $0"$  . . . at a normal rated capacity of up to 15 tons per hour. Labor costs are negligible . . . one man can handle up to 20 tables.

Make sure of getting your *full profits* by reclaiming and saving the smaller sizes. Write to the Deister Machine Company for details on how Plat-O Coal Washing Tables may efficiently and profitably increase your operations.



**DEISTER MACHINE COMPANY**  
FORT WAYNE 4, INDIANA

the Estevan-Bienfait area be granted. The assessment would amount to 3c. per ton and would be paid by producers. Also it was recommended that miners work 44 hours per week, rather than 40 hours as urged by the union. Indications were that the board's recommendations would serve as a basis for settlement of the current dispute.

Federal and provincial mines departments are cooperating in experiments aimed at producing gasoline from Nova Scotia coal. Tests carried out in Ottawa have disclosed that gasoline can be produced from this coal at a cost of 5c. to 7c. per gallon, predicated on coal costs of \$2.50 per ton at the mine. Current coal costs, however, are running far above the base figure. Cape Breton coal has produced as much as 125 gal. of gasoline per ton in laboratory tests.

**Moscow**—Coal miners in the Khabarovsk region, who are reported already to have produced 170,000 tons above last year's total, also are building a new town in the Soviet Far East. The new town, called Raichikhinsk, is located near an open-cut mine scheduled to open in 1948 with an annual capacity of 1,000,000 tons. New housing construction will include seven two-story and 90-duplex-apartment brick dwellings as well as new private homes for 550 miners and their families.

**India**—India faces a coal crisis that may paralyze her plans for long-term industrialization. Railway inefficiency lies at the root of her trouble, with the nation's recent partition adding to the confusion. Car turnaround time has been increasing steadily since the end of the war and the transfer of populations with its attendant shift of railway operating personnel has added complications. In the Bihar coal fields, stockpiles are up to 2,500,000 tons against 1,000,000 tons normally on hand and only about 2,000 railway cars daily are available to move stocks. Smaller collieries, faced with costs 400 percent above prewar levels are being closed down for lack of money to tide them over until normal transport is resumed. Producers are forecasting that the situation will get even worse in the next six months. Two temporary remedies have been suggested: (1) that the government resume its wartime practice of paying collieries in advance for coal stored on the premises and (2) that the government arbitrarily cut output of all Bengal and Bihar collieries by 25 percent.

Meanwhile, in the coal fields of Berar, the Central Provinces and Orissa, a government panel has recommended a wage increase of 25 percent, cost-of-living allowances ranging from 40 to 100 percent of base pay and a bonus payment equal to four months' pay. Coal prices are expected to be increased accordingly.

**Australia**—Mechanization of the Bulli, Mt. Keira and Wongawilli col-

anted.  
to 3c.  
pro-  
ended  
week,  
by the  
t the  
serve  
f the

es de-  
experi-  
asoline  
carried  
that  
n this  
gallon,  
50 per  
costs,  
ve the  
al has  
f gaso-

e Kha-  
ted al-  
0 tons  
build-  
et Far  
aichik-  
pen-cut  
8 with  
0 tons.  
include  
-apart-  
as new  
rs and

is that  
g-term  
iciency  
e, with  
adding  
around  
steadily  
and the  
its at-  
erating  
ions. In  
les are  
,000,000  
y about  
e avail-  
ler col-  
percent  
g closed  
de them  
is re-  
ecasting  
n worse  
tempo-  
ggested:  
ume its  
ollieries  
on the  
ernment  
Bengal  
percent.  
ields of  
ees and  
has rec-  
e of 25  
owances  
percent of  
nt equal  
ices are  
ordingly.

of the  
willi col-

COAL AGE



**THIS  
CAN'T  
HAPPEN  
HERE**

## AMSCO MANGANESE STEEL ROLLERS Won't Score . . . . . Protect Wire Rope

Kill two costs with one installation — up to 96% longer roller service and 51% longer wire rope service reported by users of Amsco Manganese Steel Rollers. Wearing out rollers and sheaves won't conserve wire rope — installation photograph above shows how rope leaves its imprint on softer metal rollers. Scored roller in turn acts as file, especially on new rope, to cause rapid wear and breakdown. Soft metal particles become imbedded in rope and further decrease service life.

Non-scoring, Amsco rollers and sheaves are made of austenitic manganese steel. Under pressure and friction, "the toughest steel known" develops a hard, "plow-share" surface finish that reduces wear to a minimum . . . yet body metal remains tough, ductile to resist sudden load impacts. Rope and roller service on Philippine log-hauling aerial tramway at right now measured in years rather than months since Amsco rollers replaced cast iron rollers. Send for bulletin 842-WS.



One of 146 rollers used at high points on an aerial tramway in Philippines to keep main line hauling cable off ground as logs are pulled through valleys.

AMERICAN

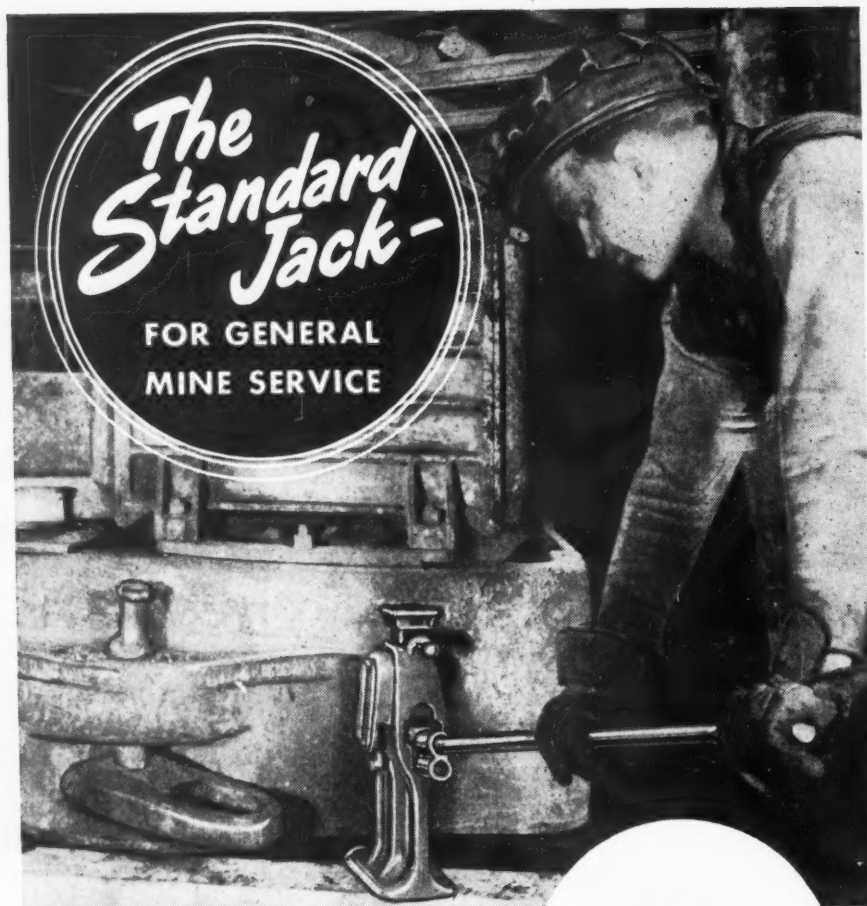
**Brake Shoe**

COMPANY

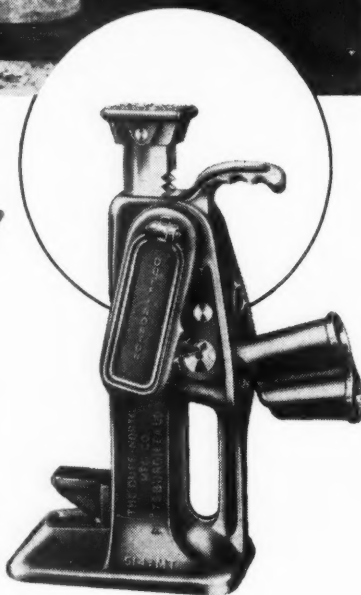
**AMERICAN MANGANESE STEEL DIVISION**  
CHICAGO HEIGHTS, ILL.

Foundries at Chicago Heights, Ill., New Castle, Del., Denver, Colo., Oakland, Calif., Los Angeles, Calif., St. Louis, Mo.  
Offices in principal cities. In Canada: Joliette Steel Limited, Joliette, Que.





## DUFF-NORTON'S 5 TON AUTOMATIC LOWERING JACK



When it comes to automatic lifting, lowering, and bracing of mine cars, monitor cars, coal loaders, cutters and other coal hauling and dumping equipment, Duff-Norton's 5 ton Automatic Lowering Jack has been a standard tool for many years. Load is instantly engaged by simple adjustment of foot lift to height required—no wasted motion—no lost jacking time. This jack is unexcelled for general mine service.

*Available* in 14, 16, and 21 inch heights for thin, medium, and thick seams. Write today for your copy of Bulletin 203-A and for our proposal on your jack requirements.



**THE DUFF-NORTON MANUFACTURING CO.**  
PITTSBURGH 30, PENNSYLVANIA

*There is a Distributor Near You*

lieries of Australian Iron & Steel Ltd. has been made possible by construction of private transmission lines from the Kembla Steel Works power house to the collieries. Power produced at the Kembla plant, where blast-furnace gases generate low-cost electricity, costs considerably less than power produced at the pits. Overcoming opposition from public-owned utilities, the company has built a 12-mile high-tension line to Bulli and a similar 8-mile line to Wongawilli. Transmission is at 33,000 volts, three-phase single circuit.

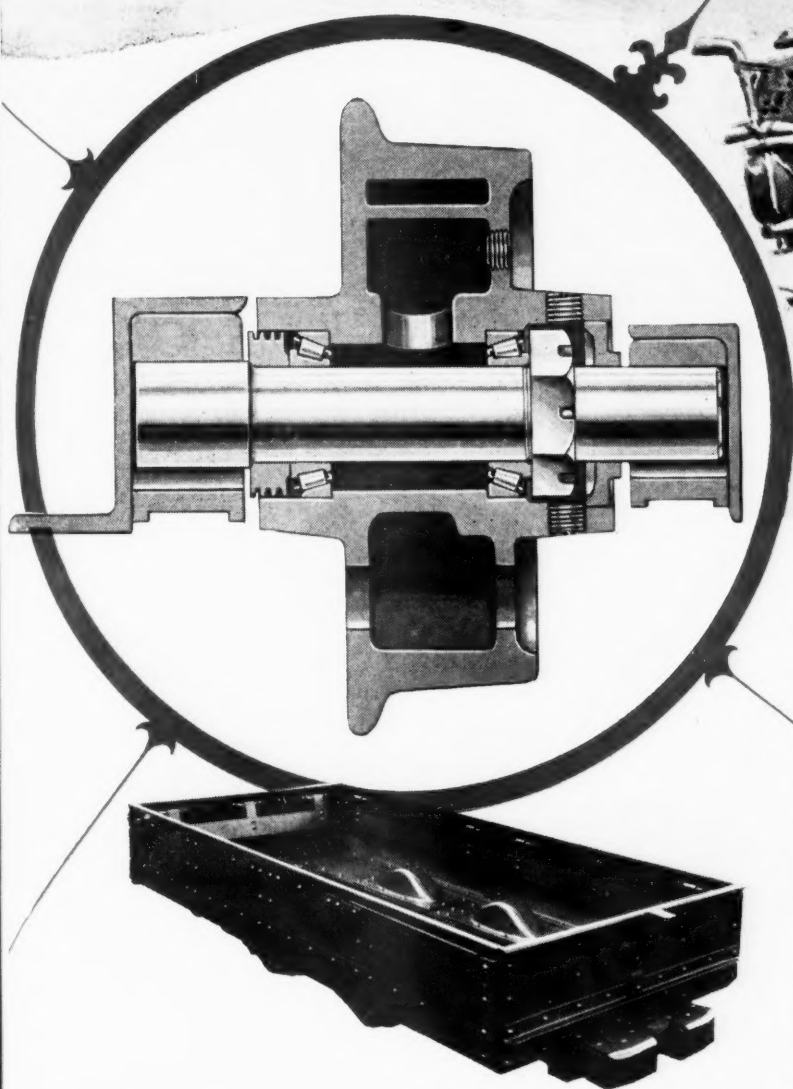
**Italy**—The Italian Government Mining Organization has discovered new coal deposits near Cagliari. According to preliminary estimates by Italian geologists, the discovery should double Italy's output of 3,000,000 tons yearly.

**Japan**—Coal production is expected to fall 2,500,000 tons short of the 30,000,000-ton goal set for this year by the Socialist government's emergency rehabilitation program. Allied occupation authorities attribute the failure to "labor agitators, subversive elements and parasites," citing the Hokkaido fields, where "the flow of machinery, equipment, food, clothing and materials for housing has been satisfactory and has improved greatly over the conditions of six months ago." "The miners, however, still are not working a full day in the pits," it is said. The Socialist-led Japanese government, on the other hand, insists that the decline in labor productivity in the mines since the end of the war is due to lack of food, housing, equipment and other aids to miners.

**Great Britain**—Britain's miners dug 4,250,000 tons of coal in the week ending Nov. 8, outstripping the preceding week's record by 160,000 tons. All but about 250,000 tons of the record production was deep-mined. Other figures cited by Prime Minister Clement Attlee gave some reason for encouragement in Britain's grim fuel outlook. The nation's reserve stock target, set at 15,000,000 tons by Oct. 31, has reached 16,500,000 tons.

Earlier, a week-long strike of 13,000 Scottish miners ended Oct. 27, after production losses estimated at 134,000 tons. The stoppage ended when miners at a mass meeting voted to resume work while awaiting a decision of the National Coal Board on claims for higher pay by maintenance and repair men. Elsewhere, 6,000 miners in Wales walked off their jobs because of dissatisfaction with delays in union negotiations on wages and other matters with the Board. The Welsh miners were urged to return to work by their union officials, pending further negotiations with the Board. Meanwhile, in Kent, miners involved in a dispute with the Board over an appointment to the staff of its southeastern division threatened to strike unless the results of the negotiations satisfied them.

# BE SURE *of* YOUR BEARINGS



Cutting, drilling and loading are important — but the bearings in your mine car wheel assemblies may mean the difference between profit and loss.

Smooth action means trouble-free action — bigger loads at higher speeds, without a hitch or a halt. Enterprise roller bearing cars deliver smooth action that cuts your production costs.

Call in Enterprise engineers to submit mine car designs to meet your particular needs. With Enterprise cars you can increase tonnage at the tippie without increasing the number of cars in use.



## ENTERPRISE

### *Wheel and Car Corporation*

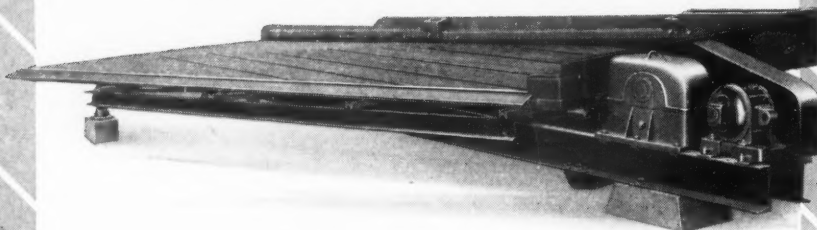
MINING AND INDUSTRIAL EQUIPMENT

*Bristol, Virginia - Tennessee • Huntington, West Virginia*

Steel  
y con-  
n lines  
power  
r pro-  
where  
ow-cost  
y less  
e pits.  
public-  
y has  
line to  
line to  
33,000  
t.  
rnmment  
covered  
ri. Ac-  
ates by  
scovery  
3,000,-  
xpected  
of the  
is year  
s emer-  
Allied  
ute the  
oversive  
ing the  
flow of  
clothing  
as been  
greatly  
months  
still are  
e pits,"  
apanese  
l, insists  
ductivity  
the war  
g, equip-  
rs.  
ners dug  
ne week  
the pre-  
000 tons.  
of the  
p-mined.  
e Minis-  
e reason  
n's grim  
reserve  
000 tons  
6,500,000  
e of 13-  
Oct. 27,  
mated at  
e ended  
ing voted  
aiting a  
al Board  
y mainte-  
elsewhere,  
off their  
cion with  
on wages  
e Board.  
ed to re-  
a officials,  
with the  
t, miners  
he Board  
e staff of  
hreatened  
cs of the



## SuperDuty COAL WASHING TABLES offer GREATEST WASHING CAPACITY

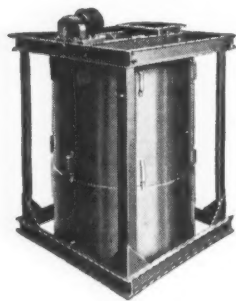


SuperDuty Coal Washing Tables have increased capacity as much as 400% on some cleaning jobs. This high production efficiency is made possible by an exclusive diagonal deck design, which places 75% more working riffles directly in the separative path.

SuperDuty is famous for producing a superior washed product, while losing less coal in refuse.

Real operating economy is another reason why SuperDutys are standard equipment on fine coal washing in nearly all the new installations. Construction is rugged and practical, but control adjustments are so simple and so infrequently necessary that one operator can supervise a large battery of tables. Power requirement is low—approximately 1 H.P. under continuous operation.

Other SuperDuty advantages are described in BULLETIN 119. Write today for full details.



### CONCENCO FEED DISTRIBUTOR

The Concenco Revolving Feed Distributor is a heavily fabricated all-steel machine, built in various types, with motor drive requiring less than ¾ H.P. in operation. This distributor effects perfectly a splitting of coal feed sluiced through its revolving tank, into any desired number of equal portions. It is especially suitable for efficiently feeding a battery of coal washing tables, giving an equal distribution of feed to each table.

### THE DEISTER ★ CONCENTRATOR COMPANY

903 Glasgow Ave. • Fort Wayne, Ind., U.S.A.

CONCENCO  
PRODUCTS

★ The ORIGINAL Deister Company ★ Inc. 1906

## New Mining Companies

Unconfirmed reports recently received list the following companies, among others, as having been incorporated to mine coal, with capital and incorporators as listed:

### Kentucky

Blue Bell Mining Co., Opal Siding, Bell County; \$10,000; Clayton and Anne Miracle and Cecil Hurst.

Pure Elkhorn Coal Co., Boldman; \$10,000; Joe and Davil Justice, Ernest and Leonard Boyd and Lowell Adkins.

Betsy Layne Coal Ramps, Ashland; \$10,000; H. N. Hatcher, F. C. Malin and L. M. Steffey.

Caney Elkhorn Coal Co., Prestonsburg; \$45,000; D. C. and Dora S. Stephens and Joe Hobson.

Jewel Coal Corp., Field, Bell County; \$50,000; O. H. and H. C. Viall and O. L. Goodin.

Wooton Coal Co., Combs; \$25,000; W. and L. Conley and Lewis Howard.

Lowman Coal Co., Ashland; \$100,000; H. K., E. B. and Bernice Lowman.

Ken Coal Co., Mayfield; \$505,000; C. D. and Martha Graham and R. A. Roberts.

Buena Vista Mining Co., Ashland; \$50,000; H. K. Lowman, Amos Tackett and Baxter Arnett.

Cornettsville Coal Co., Jeff, Perry County; \$25,000; Henry and Dorothy Kelly and Mark Cann.

### Missouri

Madison Coal Co., St. Louis; \$25,000; E. Chestnut, J. B. Margolies, Harry Libenstein and others.

Appleton Coal Co., Appleton City; originally a Kansas corporation, now authorized to use \$36,000 of its \$50,000 capital for operations in Missouri; G. A. Anderson, Missouri agent.

### Nebraska

Shirley Coal Corp., Omaha; \$100,000; Anna C. Loekner, resident agent.

### Pennsylvania

Ferrell Branch Coal Co., Delbart; \$50,000; E. E. Tomlinson Jr., Rose Allen and others.

### Virginia

Tryon Coal Co., Richlands; \$100,000; Richard R. Blythe, agent.

Virginia Coals, Inc., Norton; \$200,000; T. M. Godwin, president.

Big Seam Coal Corp., Virginia City; \$150,000; R. H. Kelly, president.

Pete Warren Corp., Norton; \$50,000; P. R. A. Warren, president.

Doran Mining Corp., Richlands; \$25,000; J. H. Shuff, president.

Centertown Coal Co., Virgilina; \$100,000; T. W. Chandler, president.

### West Virginia

Rock Creek Mining Co., Sharples, Logan county; \$50,000; D. M. Echols, Chris Holt and Siegel Workman.

Junior Pocahontas Coal Co., Goodwill, Mercer County; \$25,000; R. W. Massie and F. J. and Nina Linkous.

Wilcox Coal Co., Daniels, Raleigh County; \$175,000; A. C. and B. K. Wilcox and Niva Dodd.

Dubena Coal Co., Follansbee; \$36,000; Michael Dubena, Agnes Chonokie and George Smith.

Mohawk Coal Co., Panther, McDowell County; \$50,000; J. G. Cartwright, J. H. Smith and Marshall Whaley Sr.

Glen Eagle Coal Co., Beckley; \$50,000; L. P. Putman and others.

Mech Smokeless Coal Co., Beckley; \$50,000; D. A. Blankenship, J. W. Evans and others.

Ferrell Branch Coal Co., Williamson; \$50,000; Juanita Hinchey, Rose Allen and E. E. Tomlinson Jr.

Coal Mining Assn. of Robert, Peter & Fowler, Inc., Huntington; \$50,000; J. E. Hagen, Jr., O. J. Riffe, Jr., and A. A. Bolen.

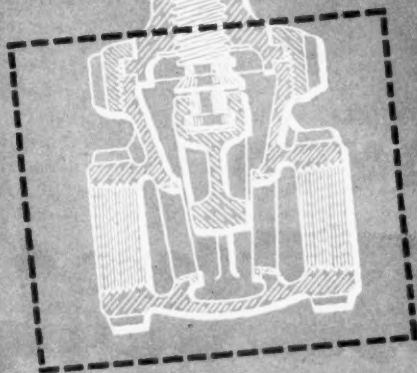


JENKINS GIVES YOU

*Super Toughness*

in the

"TROUBLE ZONE"



in the NEW FIG. 270-U  
200 lb. BRONZE GATE



**MONEL SEAT RINGS**

— 2½ TIMES AS HARD  
AS VALVE BODY BRONZE  
— PLUS AN EASILY RE-  
PLACEABLE BRONZE  
WEDGE. TRY AND BEAT  
THAT COMBINATION FOR  
LONG LIFE, LOW MAIN-  
TENANCE!

*Plus....*

IN the NEW Fig. 270-U Bronze Gate Valve, Jenkins engineers give you a practical design to checkmate trouble in the "trouble zone" — and cut maintenance to a new low.

Wear affects only the most accessible part — the bronze wedge — which can be replaced simply by slipping it off the stem and slipping on a new one. The seat rings, expanded in the body, are super-tough MONEL, for lifetime durability. Convincing tests, in toughest service, prove it the best seating combination to beat wear, reduce care.

Get complete details of this NEW Jenkins Fig. 270-U. See why it's your best buy in a 200 lb. Bronze Gate, especially for unusually severe conditions, such as in oil refineries, chemical, food, and rubber plants.

**LARGE SPINDLE THREADS**—Plenty of large diameter, sturdy threads reduce wear to a minimum, insure easy operation.

**EXCEPTIONALLY RUGGED BODY, BONNET, AND BONNET RING** — Withstand rough usage, shocks and hydraulic pressure far beyond rating.

**DEEP STUFFING BOX — MORE PACKING**—Keeps packing tight around spindle with less friction, permits spindle to be turned with less effort.

**NEW FOLDER** — Describes many other exclusive features that mean extra years of low-cost performance.



WRITE FOR THIS FOLDER. It describes the Fig. 270-U and many other popular Jenkins Bronze Gate Valves. Or, ask your Jenkins Distributor.

MAIL THE  
COUPON  
TODAY



LOOK FOR THIS DIAMOND MARK

SINCE 1864

**JENKINS VALVES**

*Types, Sizes, Pressures, Metals for Every Need*

JENKINS BROS.,  
80 White St., New York 13, N. Y.

Send Bronze Gate Valve Folder.

NAME.....

COMPANY.....

ADDRESS.....



**THESE JOB-PROVED**  
**EUCLID** *features*  
**BRING HAULING COSTS DOWN**

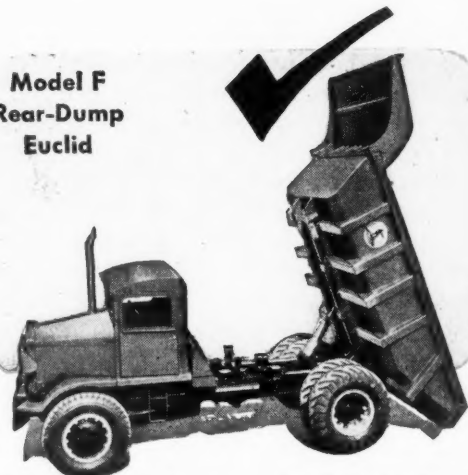
✓ **GREAT BODY AND FRAME STRENGTH**  
 Strong, rigid frame and sturdy body are designed and built to withstand the impact and wear of loading heavy excavation with large shovels and draglines, and traveling over rough haul roads with 15-ton loads.

✓ **POWERFUL AND EFFICIENT DRIVE AXLE**  
 Double-reduction, planetary type drive axle attains tremendous pulling power. Full rear axle load is carried on heavy-duty tapered roller bearings. Final reduction is taken at each wheel.

✓ **DEPENDABLE PERFORMANCE . . .** Records from all types of mining and construction jobs are proof of the efficiency and long life achieved by proved design and painstaking production of every part.

Complete specifications and literature on all Euclid earth-moving equipment are available from your Euclid distributor or by writing direct.

**Model F  
 Rear-Dump  
 Euclid**



Built for a wide range of off-the-highway heavy-duty hauling . . . 15-ton capacity . . . 9.7 cu. yds. struck measure . . . loaded top speed 22 m.p.h. . . powered by 150 to 200 h.p. Diesel engines.



Cedar Grove Mining Co., Peytona, Boone County; \$60,000; Norman Johnson, Louis Scollish and others.

Gregory & Poole Coal Co., Duo, Greenbrier County; \$200,000; C. N. Caldwell, H. B. Davis and D. H. Jackman.

Bradshaw-Pocahontas Coal Co., Bradshaw, McDowell County; \$10,000; W. L. Largen, C. C. Waldron and Ralph Waite. Wally-Morris Mines, Big Chimney; \$100,000; J. E. Parker, Wilson Anderson and J. L. Lambert.

## Preparation Facilities

Eastern Gas & Fuel Associates, Kopperston Mine, Kopperston, W. Va.—Contract closed with McNally-Pittsburg Manufacturing Corporation for 300 t.p.h. of additional washing facilities to clean 5x $\frac{3}{4}$ -in. raw coal; the 5x $\frac{3}{4}$  to be prescreened into 5x1 $\frac{1}{4}$  and 1 $\frac{1}{4}$ x $\frac{3}{4}$  and washed separately in two McNally-Menzies 10-ft. cones; complete dewatering and sizing over vibrating screens for washed-coal classification;  $\frac{3}{8}$ -in. degradation incurred during washing to be recovered and dewatered over vibrating screens for mixing with dry  $\frac{3}{8}$ x0-in. slack.

Eastern Gas & Fuel Associates, Wharton No. 2 mine, Wharton, W. Va.—Contract closed with McNally-Pittsburg Mfg. Corp. for complete 500-t.p.h. tippie and washer; 5-in.-plus to be hand picked and crushed to minus 5-in. prior to washing; then to be classified into 5x1 $\frac{1}{4}$  and 1 $\frac{1}{4}$ x0-in. and washed separately in two McNally-Norton automatic washers;  $\frac{1}{8}$ x0-in. is removed from washed coal centrifugally through McNally-Carpenter centrifugal dryers prior to thermal drying; thermal-dried product to be mixed back with 2x $\frac{1}{8}$  washed screenings; sizes loaded: 5x2, 2x0 and 5x0.

Diamond Smokeless Coal Co., Diamond Mine No. 2, Boltz, Pa.—Contract closed with McNally-Pittsburg Mfg. Corp. for 300-t.p.h. McNally-Norton automatic washer with the following facilities: r.o.m. to be crushed in McNally-Pittsburg crusher to 5x0-in.; raw coal to be prescreened at  $\frac{3}{8}$ -in., with the  $\frac{3}{8}$ -minus bypassing the McNally-Norton automatic washer; washery feed size 5x $\frac{3}{4}$ -in.; after washing, the coal is to be classified at 5x2, 2x1 and 1x $\frac{3}{8}$ ;  $\frac{3}{8}$ -in. degradation incurred in washing will be recovered and mixed back with normal  $\frac{3}{8}$ x0-in. raw coal.

Mahan-Ellison Coal Corp., No. 2 mine, Lansing, Tenn.—Contract closed with McNally-Pittsburg Mfg. Corp. for 300-t.p.h. screening-plant addition to present facilities, consisting of shaker screens to deliver 5-in.-plus lump, 5x3, 3x2 and 2x0-in. nut slack; complete with lump- and egg-loading booms, rescreen- and slack-conveying facilities.

Red Jacket Coal Corp., Coal Mountain Mine No. 12, Coal Mountain, W.

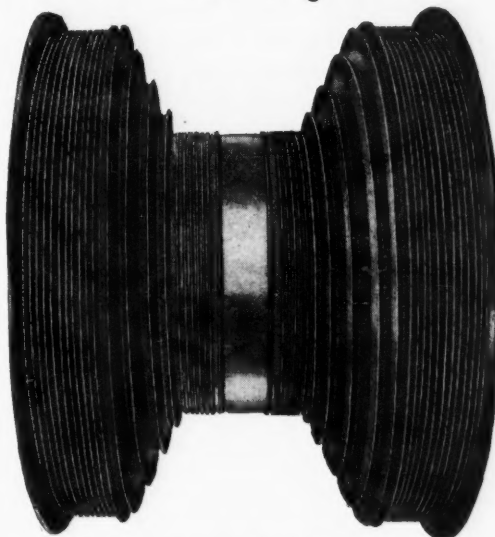
# "Raising EFFICIENCY" "Lowering OPERATING COSTS"

Designed after careful time studies of hoisting cycles and practical engineering experience, they have now been proved by years of outstanding performance. Long life is assured by heavy duty construction and unusual rigidity.

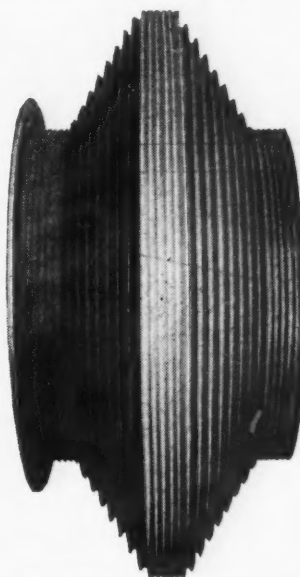
Holmes' Winding Drums are designed and custom built in a wide range of sizes and styles, to meet your particular requirements.



SINGLE CYLINDRO  
CONICAL DRUM  
8 FOOT TO 12 FOOT



DOUBLE CYLINDRO CONICAL DRUM  
8 FOOT TO 12 FOOT



SINGLE CONICAL DRUM  
6 FOOT TO 11 $\frac{1}{2}$  FOOT

Listed below are a few examples of the tonnages being accomplished with Holmes' Winding Drums

Cars Average	Per Hr. Max.	Coal Per Car	Lift	Power
250	255	7000 lbs.	412 ft.	Electric
250	255	7000 lbs.	462 ft.	Electric
255	260	6800 lbs.	422 ft.	Electric
200	215	6500 lbs.	500 ft.	28" x 42" Steam
207	220	6000 lbs.	500 ft.	24" x 42" Steam
210	225	5300 lbs.	475 ft.	24" x 36" Steam
214	240	6000 lbs.	365 ft.	24" x 36" Steam
180	193	8000 lbs.	563 ft.	26" x 42" Steam

**ROBT. HOLMES & BROS., INC.**  
DANVILLE, ILLINOIS

hway  
y...  
d top  
50 to



# NEW LIFE FOR OLD CABLES

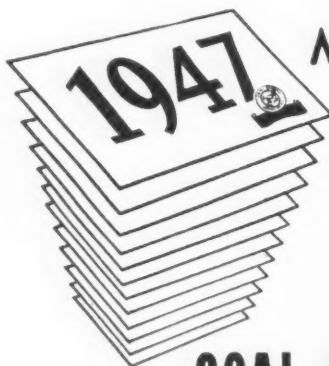
## 7 Point Superiority



- 1 Double grip . . . both sides adhesive.
- 2 Great tensile strength . . . tough.
- 3 Won't tear, ravel or pucker.
- 4 Resists abrasion.
- 5 Acid- and alkali-proof.
- 6 Extra thick . . . one layer insulates.
- 7 Exceeds A.S.T.M. specifications by 300% in adhesive-ness, 26% in tensile strength, 290% in dielectric strength.

## RUBEROID INSULATING TAPE

The RUBEROID Co., Executive Offices, 500 Fifth Avenue, New York 18, N. Y.



More than a  
**DECADE**  
of  
*Service*  
to the

## COAL MINING INDUSTRY

As we near the closing of another milestone in Coal Mining Achievements, we are proud to have played an important part in **LOWERING MINE ACCIDENT RATES...REDUCING LITIGATIONS, INCREASING THE RATE OF PRODUCTIVE MAN-HOURS.**

**COAL OPERATORS  
CASUALTY COMPANY**

GREENSBURG, PENNSYLVANIA



Va.—Contract closed with McNally-Pittsburg Mfg. Corp. for 130-t.p.h. washing plant; r.o.m. to be broken to 5-in.-minus, prescreened at ¼-in. with 5x¼-in. comprising the washer feed to one McNally-Norton automatic washer; ¼x0-in. to bypass wet-washing equipment; washed 5x¼-in. to be dewatered and classified into following sizes: 5x3, 3x1¼ and 1¼x¼; the ¼-in.-minus degradation to be recovered and mixed with the bypassed ¼x0-in.

Colitz Coal Co., Pottsville, Pa.—Contract closed with Wilmot Engineering Co. for one 3½-ft.-diameter Wilmot Hydrotator for cleaning pea and buck No. 1 refuse; feed capacity, 35 t.p.h.

Haddock Mining Company, Beaver Meadow, Pa.—Contract closed with Wilmot Engineering Co. for one 5-ft.-diameter Wilmot Hydrotator for cleaning buckwheat No. 1; feed capacity, 60 t.p.h.

Capone Coal Co., Avoca, Pa.—Contract closed with Wilmot Engineering Co. for one 2½-ft.-diameter Wilmot Hydrotator for preparing barley; feed capacity, 15 t.p.h.

T. F. Steel Coal Co., Junedale, Pa.—Contract closed with Wilmot Engineering Co. for two 3½-ft.-diameter Wilmot Hydrotators for cleaning rice and barley; total feed capacity, 50 t.p.h.

Porter Elkhorn Coal Co., Martin, Ky.—Contract closed with Jeffrey Mfg. Co. for tipple; 150-t.p.h. raw-coal feed, run-of-mine.

Industrial Collieries Corp., Ellsworth, Pa.—Contract closed with Deister Concentrator Co. for 16 SuperDuty Diagonal-Deck No. 7 coal-washing tables and two Concenco revolving feed distributors.

### Coal Publications

Miscellaneous Accidents in Bituminous-Coal Mines, Coal-Mine Accident Prevention Course, Section 7. U. S. Bureau of Mines, M. C. 60. 85 pp. 5½x9¼-in.; paper. 25c., Supt. of Documents, Government Printing Office, Washington 25, D. C. The last of a series of pamphlets that make up a safety course for mine officials and those seeking promotion. This section deals with accidents that are not readily classifiable, especially non-fatal accidents on the surface and underground and those caused by machinery.

Gasification of Lignite and Sub-bituminous Coal, by V. J. Parry, D. C. Gernes, E. O. Wagner, J. B. Goodman and A. W. Koth. U. S. Bureau of Mines, R. I. 4128. 69 pp. plus 26 pp. of illustrations. 8x10½ in.; paper; mimeo. Free. Design and operation

# overhung loads?

## DE LAVAL SLEEVE BEARINGS

For carrying heavy overhung loads imposed by gears, cranks, pulleys or sprockets, De Laval Worm Gear Speed Reducers can be furnished with generously proportioned sleeve bearings on the output shaft; a choice of either sleeve bearings or anti-friction bearings being available in most models. Both can be depended upon for trouble-free service.

### ILLUSTRATION NOTE:

Use of an auxiliary chain and sprocket, with the worm gear speed reducer carrying the major reduction, allows ease of subsequent change of over-all speed reduction, facilitates interchangeability of speed reducers throughout the plant, and reduces installation costs.

If your speed reducers require an overhung load, consult a De Laval representative.

**ONE OF 93.** This single reduction De Laval Worm Gear Speed reducer is available with many standard gear ratios and is but one of 93 sizes of standard De Laval Worm Gear Speed Reducers.

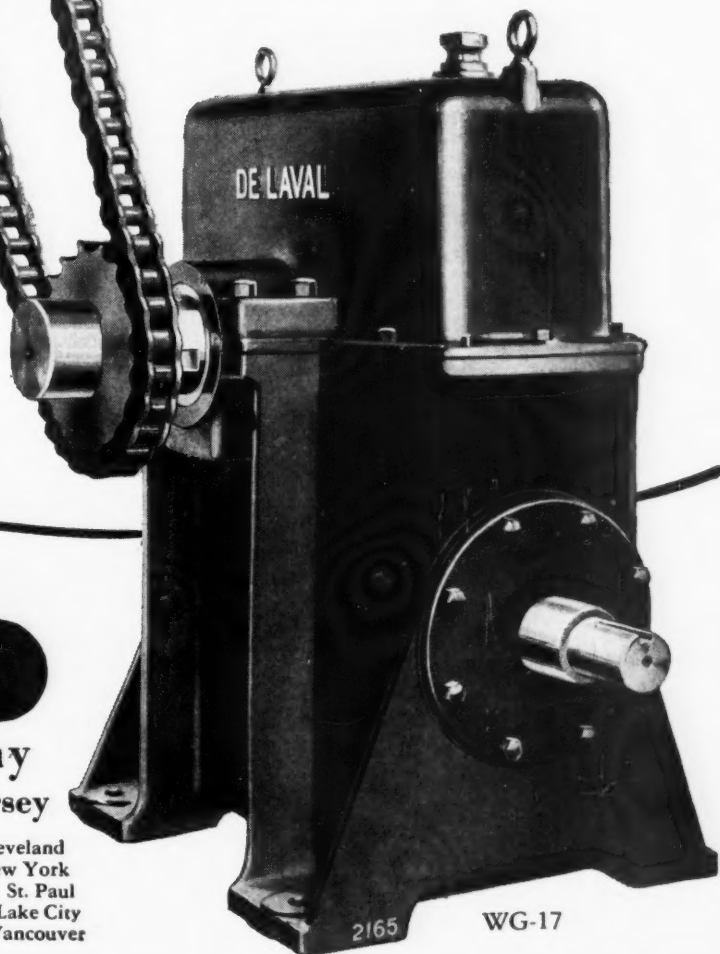
### Worm Gear Division

# DE LAVAL

## Steam Turbine Company

Trenton 2, New Jersey

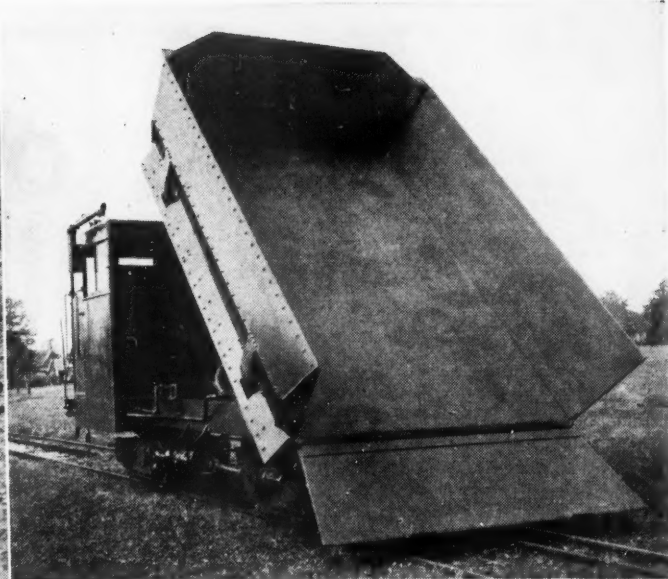
Atlanta • Philadelphia • Charlotte • Pittsburgh • Cleveland  
Rochester • Detroit • San Francisco • Chicago • New York  
Denver • Kansas City • Helena • Boston • Houston • St. Paul  
Washington, D. C. • Los Angeles • New Orleans • Salt Lake City  
Seattle • Tulsa • Edmonton • Winnipeg • Toronto • Vancouver



TURBINES • HELICAL GEARS • WORM GEAR SPEED REDUCERS • CENTRIFUGAL PUMPS • CENTRIFUGAL BLOWERS AND COMPRESSORS • IMO OIL PUMPS



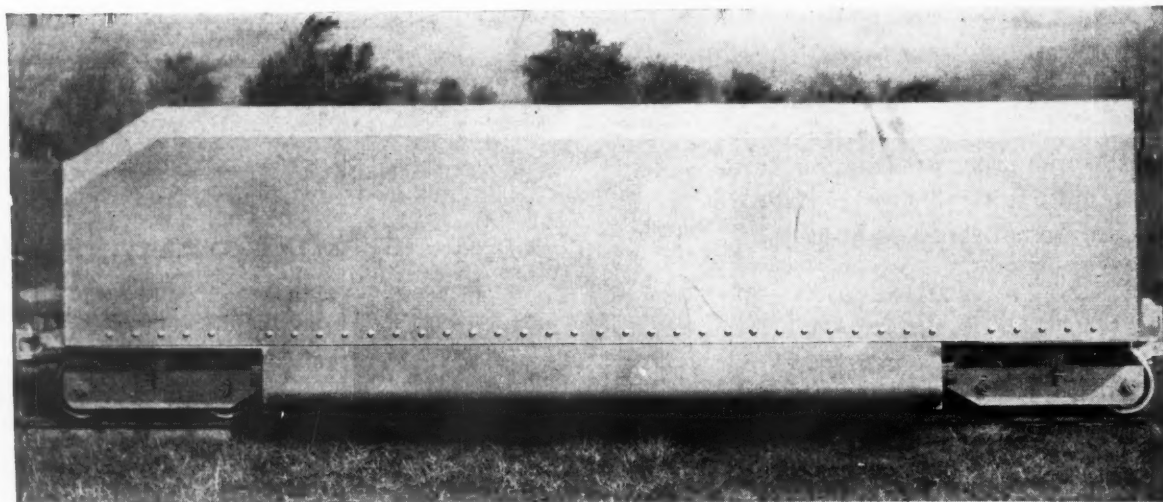
**4-Car Train above transports 100 tons of mine refuse up 10% grade at 10 m.p.m. Elevation is gained rapidly and dumping space conserved. Automatic dumping of either side and over the end makes the dump with least labor.**



**Differential Larry shown above dumps three ways. Automatic dumping controlled from operator's cab. Extends the dump laterally and longitudinally at the same time gaining elevation at the desired rate. End door in dumping position acts to extend dump by plowing material over the end of the dump and to raise track by plowing material into it.**

### **DIFFERENTIAL REFUSE DISPOSAL EQUIPMENT**

Differential has standard equipment for every refuse disposal problem. All equipment—whether 10 tons, or 1,000 tons per hour—is sturdy, rugged and simple. On very steep grades Differential equipment performs in an outstanding manner. Builds and maintains the dump with the least labor cost. Send for Buletin D-50.



### **DIFFERENTIAL MINE CARS**

Differential mine cars feature largest capacity within given dimensions. Results in fewer cars, maximum output per loading unit, and least maintenance cost. Differential cars travel at high speeds with safety—negotiate sharp curves easily. Construction is simple and rugged. Send for Bulletin D-53.

## **DIFFERENTIAL STEEL CAR COMPANY**

**FINDLAY, OHIO, U. S. A.**

*Builders of Haulage Equipment Since 1915*

**AIR DUMP CARS      MINE CARS      MINE LOCOMOTIVES      ROCK LARRIES      DUMPING DEVICES  
BURDEN-BEARING LQCOMOTIVES      STOCKPIILING CARS      COMPLETE HAULAGE SYSTEMS**



of two pilot plants for gasification of low-rank coals in Colorado and North Dakota, using an externally heated retort.

**A.S.T.M. Standards on Coal and Coke (With Related Information).** American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. 162 pp. 6x9-in.; paper. \$2. Thirty-three specifications, methods of tests and definitions prepared by A.S.T.M. Committee D-5 on Coal and Coke.

**Electricity for Coal-Mining Students,** by J. Stevenson and W. Miller. The Technical Press Ltd., Gloucester Road, Kingston Hill, Surrey, England. 243 pp. 5x7½-in.; cloth. 8 sh., 6 d. (about \$1.75). A textbook on electricity for mining students preparing for the examination for colliery managers' Certificates of Competency. General principles, simple explanations and illustrations.

**Application of Overfire Jets to Prevent Smoke from Stationary Plants,** by R. B. Engdahl and W. S. Major. Bituminous Coal Research, Inc., Oliver Building, Pittsburgh 22, Pa., Technical Report No. VII, revised, August, 1947. 31 pp. 8½x11-in.; paper. 25c. An enlarged and revised guide for design, construction and installation of overfire jets.

**Procedure Used in Fighting and Sealing a Fire in an Ohio Coal Mine and Recovery of the Mine by Air-Locking Methods,** by G. W. Grove, F. E. Griffith and H. R. Burdelsky. U. S. Bureau of Mines, I. C. 7418. 18 pp. plus 6 pp. of illustrations. 8x10½-in.; paper; mimeo. Free. Outstanding feature of this recovery was that 1,550 man-hours was spent in hazardous atmospheres behind the fire seals wearing self-contained oxygen breathing apparatus, without personal injury beyond slight temporary illness of two men. The circular is not intended as a pattern for all mine recovery but shows that this kind of work can be done safely and effectively if planned and organized properly.

**Vibrator-Type Multiple-Shot Blasting Unit,** by F. C. Gibson and F. W. Brown. U. S. Bureau of Mines, R. I. 4136. 5 pp. plus 3 pp. of illustrations. 8x10½-in.; paper; mimeo. Free. Design, operation and test results of a blasting unit capable of firing 10 detonators in series and safe for gassy mines. The unit probably will meet Bureau permissible standards.

**Report on the Beneficiation of Drumheller Sub-bituminous Coals by Briquetting Using Various Kinds of Binders,** by E. Swartzman. Mines & Geology Branch, Department of Mines & Resources, Ottawa, Canada. Memo. Series No. 92, July, 1947. 49 pp. plus 8 pp. of illustrations. 8½x11-in.; paper; mimeo. Results of 2½ years of experimentation with briquetting sub-bituminous coals from the Drumheller field in Alberta.

## SAVE MANPOWER, SAVE TIME

### with COFFING HOISTS



The HOIST-JACK  
Lifts, Pulls or  
S-t-r-e-t-c-h-e-s



The  
"MIGHTY-  
MIDGET"  
PULLER  
Lifts or Pulls  
a  
500 lb. Load!

WRITE for Illustrated  
Bulletins on Any Hoist  
shown here.

Save money with the right hoist for the right job, selected from the complete Coffing line that covers industry's needs on all hoist work. Brand new is the Coffing Hoist-Jack. Use it as a hoist, as a jack or as a load binder. Operates with or without stand; has a capacity of 2000 lbs.; safety tested to 100% overload.

Equally versatile is the "Mighty-Midget" Puller; small in size but mighty in power for pulling or lifting—weighs only 6½ lbs., yet handles a 500 lb. load. Two way handle (with "safety-load" feature) serves as lever or high speed crank.

**COFFING HOIST COMPANY**  
Danville, Illinois

#### Look to COFFING for the Hoist You Need

Coffing "Safety-Pull" Ratchet Lever Hoists meet industry's needs for easy operation, safety, rugged construction. Nine models to handle from ¼ ton to 15 tons.

The Coffing "QUICK-LIFT" Electric Hoist is equipped with heavy duty motor. Hook or trolley suspension. Pendant control so accurate that loads may be raised or lowered by fractions of an inch. Seventeen models—500 to 4,000 lbs. capacity.



SAFETY-PULL  
RATCHET  
LEVER-HOIST



QUICK-LIFT  
ELECTRIC  
HOIST

## HELP YOURSELF BY HELPING YOUR DEALERS

### • Freezeproof your coal with • WYANDOTTE CALCIUM CHLORIDE

• Dealers have a right to complain when coal is frozen in the car. It means lost delivery time and extra labor—and the remedy is so simple and economical! All you have to do is treat your coal with Wyandotte Calcium Chloride.

• Coal freezeproofed with Wyandotte Calcium Chloride will unload readily even in sub-zero weather, leaving the car the same grade as when loaded. No special equipment is required to handle Wyandotte Calcium Chloride for freezeproofing.

Your dealers will appreciate this attention on your part—and will remember you when ordering again.

Let us tell you more about the advantages of using Wyandotte Calcium Chloride to freezeproof coal. Just mail the coupon.

**WYANDOTTE CHEMICALS CORPORATION**  
Michigan Alkali Division  
Wyandotte, Michigan  
Send me literature and further information about the uses and advantages of Wyandotte Calcium Chloride.

Name \_\_\_\_\_

Address \_\_\_\_\_

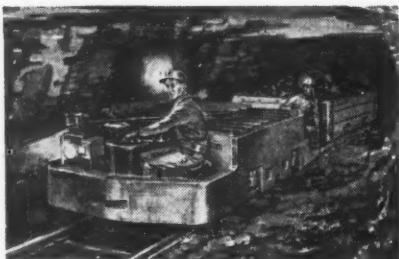
Title \_\_\_\_\_



**Wyandotte**  
REG. U. S. PAT. OFF.

**CALCIUM CHLORIDE**

WYANDOTTE CHEMICALS CORPORATION • Michigan Alkali Division • Wyandotte, Michigan

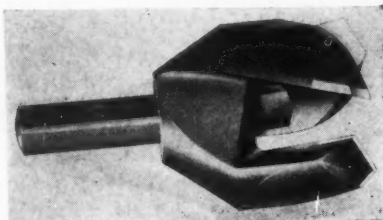


# Equipment News

More Detailed Information and Descriptive Literature Normally Are Available on Request Directly to the Manufacturer

## Wire Rope

"CenterFit," a new all-steel wire rope said to cut rope costs up to 50 percent, has been announced by Jones & Laughlin Steel Corp., Pittsburgh 30, Pa. The 17 strands in CenterFit are laid together in a single closing operation and all run in the same direction. The strands fit snugly into the valleys between the eight inside strands and thus crossing of the strands is eliminated, with internal nicking prevented and longer wear resulting, according to the manufacturer. The CenterFit design also provides more steel, less void space and, as a result, greater strength, it is said. Faster operating speeds and savings on sheave and drum maintenance also are cited by the company.



enables the bit to drill at much faster speeds than straight-prong bits. Turning the prongs at an angle accelerates the cuttings away from the cutting edge and also keeps the point of the cutting edge more firmly into the material being drilled. As a result, it is said, a more uniform hole can be drilled and the machine can operate at lighter loads.

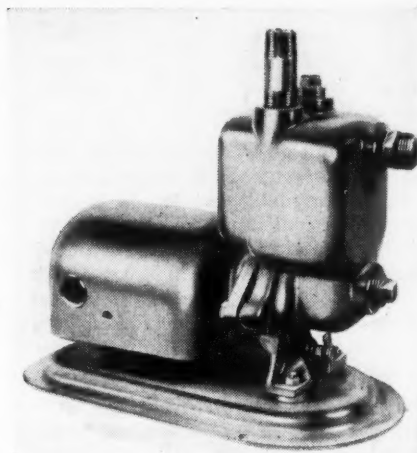
## Drill Bit

Kennametal Inc., Latrobe, Pa., has announced a new three-prong drill bit for drilling strip-mine overburden. The Kennametal cutting edge is set at an angle, it is said, so that it cuts through rock more effectively and

## Pump

Its new "Mine Spray" pump has been developed as a small, compact, lightweight pump for use in and around mines, according to the Gorman-Rupp Co., Mansfield, Ohio. Weighing only 27 lb., the pump can easily be carried about and its compact size permits installation in small

spaces, according to the manufacturer. Capacity of the pump is 8 g.p.m. at 40 lb. pressure and a 25-ft. head. It is powered by a Lamb Electric universal-type 1/2-hp. motor, 110/115 volts a.c., 60 cycles or less,



or d.c. The pump is self-priming, and maintenance is reduced to a minimum, it is said, since the impeller is the only moving part and can be removed easily for servicing by unskilled labor with ordinary tools.



MODEL KBR-14, recently announced by the International Harvester Co., 180 North Michigan Ave., Chicago 1, is a heavy duty off-highway truck, available in 161-, 179- and 215-in. wheelbases, recommended by IH for heavy service as a truck-tractor or straight truck. The 586-cu. in.-piston-displacement engine develops 200 maximum b.hp. and maximum torque of 475 lb.-ft. at 1,000 r.p.m. The unit has a 15-in. single-plate clutch, 5-speed transmission with direct-in-fifth as standard and overdrive as optional. The gross-vehicle-weight rating of the KBR-14 is from 32,000 to 41,600 lb., depending on the road and loading conditions as determined under the IH point rating system.

## Scraper Bucket

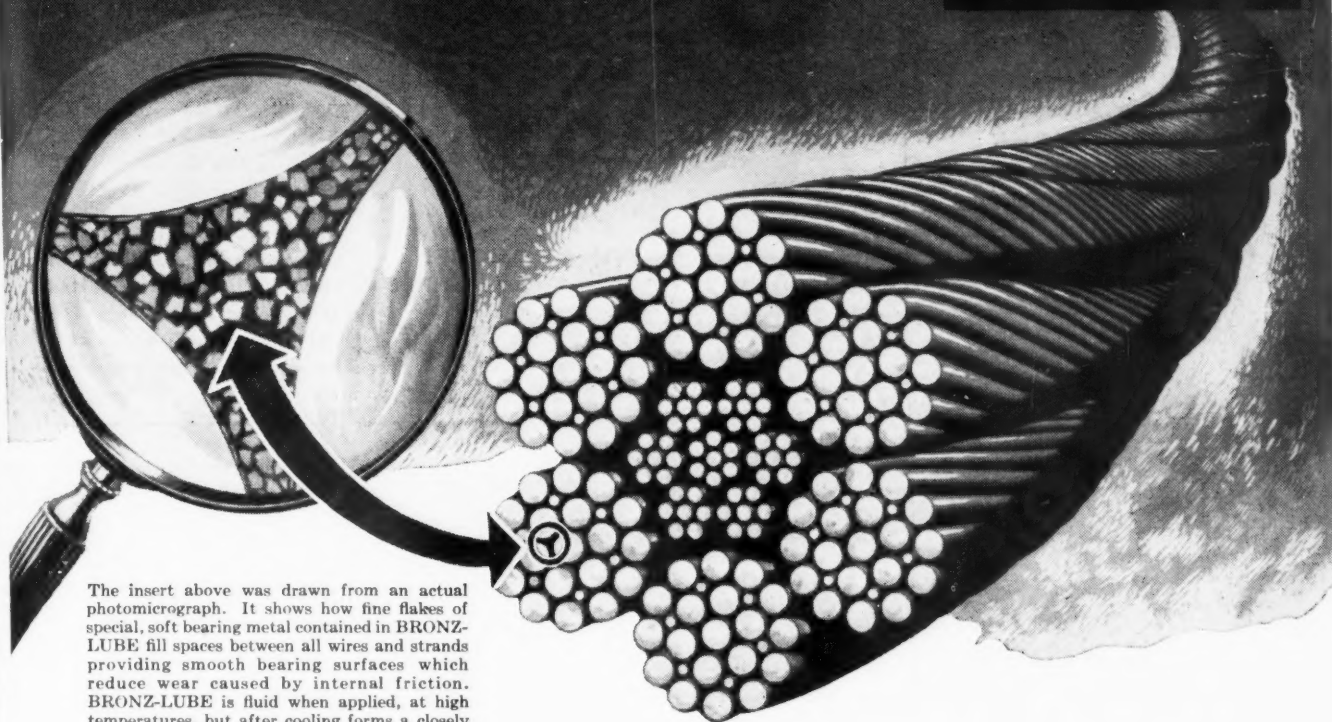
A new scraper bucket, the main part of which is said to be cast in one integral piece from Uraloy cast steel, has recently been announced by the Cate Equipment Co., 49 East 9th South, Salt Lake City 4, Utah. The one-piece construction eliminates all rivets and bolts from the body and the outrigger arms are designed to come around the sides of the body, it is said, so that possibility of the unit hooking onto timber or other ob-





**For Longer Service Life**  
**ALL J&L PERMASET PREFORMED WIRE ROPE**  
**Now Lubricated with BRONZ-LUBE...**

**J&L  
STEEL**



The insert above was drawn from an actual photomicrograph. It shows how fine flakes of special, soft bearing metal contained in BRONZ-LUBE fill spaces between all wires and strands providing smooth bearing surfaces which reduce wear caused by internal friction. BRONZ-LUBE is fluid when applied, at high temperatures, but after cooling forms a closely adhering coating that will not melt below 200°F.

**... Containing soft alloy bearing metal that  
plates each wire and strand for longer wear!**

Wire ropes are machines and like all machines need the best lubricant to give long service life. BRONZ-LUBE a new exclusive J&L wire rope lubricant, contains minute particles of soft anti-friction bearing metal. This new expensive lubricant with exceptional qualities for adhering to steel has been developed through months of research by J&L wire rope engineers and lubrication experts. Each individual wire, each strand and the entire J&L wire rope is coated with this superior, longer lasting lubricant. It reduces wear caused by internal friction when the rope is working under heavy loads and flexing over sheaves and drums. BRONZ-LUBE having a high film strength of 50,000 lbs. per square inch will not "squeeze out" between rope wires under extreme lateral pressures. In addition to being a better lubri-

cant, BRONZ-LUBE is water repellent—retards washing off even in salt water. BRONZ-LUBE prevents corrosion... resists abrasion. The perfect bond between BRONZ-LUBE and steel wire provides a plating composed of petroleum and soft bearing metal that does not creep, wipe off, or drip, even on a hot summer day. Yet it is extremely flexible and does not harden, crack or decrease in adhesion at 40° below zero! You get all these advantages at no extra cost when you buy J&L Wire Rope lubricated and protected with BRONZ-LUBE.

All J&L permaset preformed wire rope is lubricated with BRONZ-LUBE. It is already setting new performance records in earth moving, material handling and oil well drilling. You can obtain this longer service... reduce your maintenance costs with J&L

BRONZ-LUBE protected Wire Rope. Place your order now with your J&L wire rope distributor or any J&L sales office or warehouse.

*Keep exact wire rope performance data. For free wire rope service record cards and convenient plastic holder, write on business letterhead to Wire Rope Sales Dept., Room 911 Jones & Laughlin Building, Pittsburgh 30, Pa.*



**JONES & LAUGHLIN STEEL CORPORATION**



IT'S THE BETTER BEARING  
THAT LASTS LONGER—  
COSTS LESS

and that means

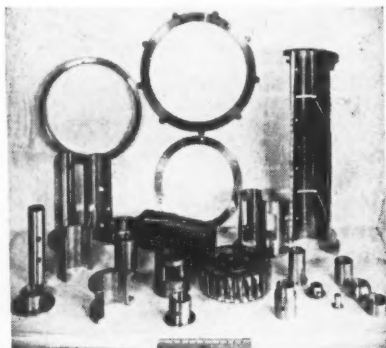


A SPECIFIC FORMULA  
FOR EACH APPLICATION

**AXLE BEARINGS  
JOURNAL LINERS  
BUSHINGS and  
WEARING PARTS**

For

**GENERAL ELECTRIC  
GOODMAN • WESTINGHOUSE  
SULLIVAN • OLDROYD  
JOY • JEFFREY  
EQUIPMENT**



### PROMET BAR STOCK

Round, hexagon, square. Rough cast, semi-finished. Cored stock all sizes (by 1/4" steps) from 1/2" minimum core to 12" O.D. and 12' lengths. 6 grades of hardness.

### PROMET BABBITTS

Lead or tin base. 3 grades

**Write for free folders.**

#### THE AMERICAN CRUCIBLE PRODUCTS CO.

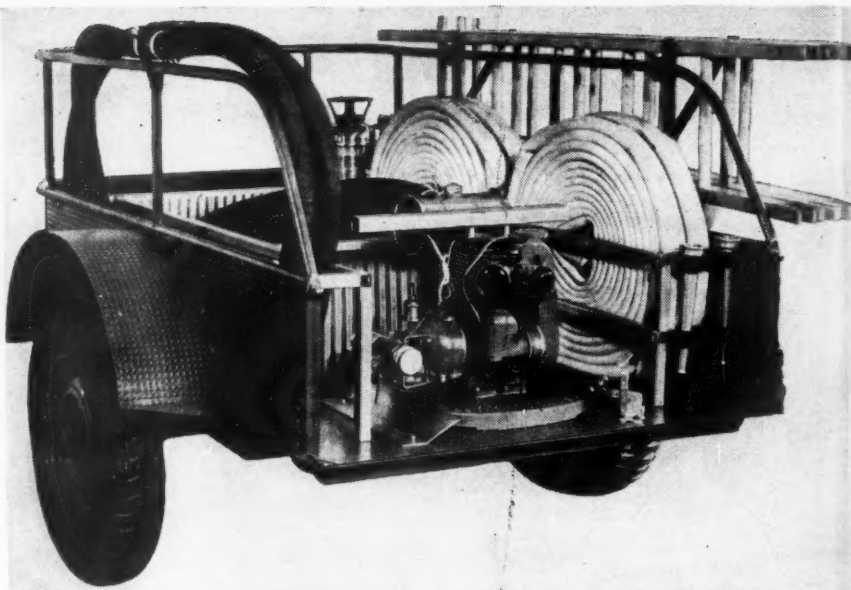
1307 Oberlin Ave., Lorain, Ohio, U. S. A.

Prompt deliveries can usually be made from  
stocks maintained at

MECHLEY, W. H., The General Supply Co., 1701 S. Kanawha St. Phone 7367  
LORAIN, OHIO, The American Crucible Products Co. Phone 6963

#### Other Representatives

ALTON, R. L., Frank E. White, 623 Main Ave. Phone 3-8624  
BIG LITTLE, W. P., WINGHAM, C. P., Concord. Box 790  
BIRMINGHAM, E. H. A., R. B. Underhill Equipment Co. Phone 2-2176  
BOSTON, CHAS. B., Dispatch Service, 16th St. at State. Phone Main 8331  
MT. LEBANON, PA., J. E. Rorer, 729 Reservoir Ave. Phone LE-5876  
WHEELING, W. VA., Palkish & Company, 118-111 Fidelity Building. Phone 1795  
WILLIAMSON, W. VA., Williamson Supply Co. Phone 1200



A COMPLETE fire department in one portable unit is offered in the new "Porto-Pumper", according to the manufacturer, Porto-Pump, Inc., 227 Iron St., Detroit 7. Mounted on a two-wheeled trailer light enough to be towed manually where necessary, the unit consists basically of a gasoline-power high-pressure utility pump capable of 40 g.p.m. at 120 lb. pressure; 75 ft. of supply hose and 250 ft. of fire hose; an 18-ft. three-section extension ladder; fire ax and hand-type fire extinguisher.

structions is reduced. The blade and the front shoe are detachable and can easily be replaced when worn, the company says. The unit is available in a 29-in. size for hoists of 5 to 6 1/2 hp., and in a 36-in. size for hoists 7 1/2 to 15 hp.

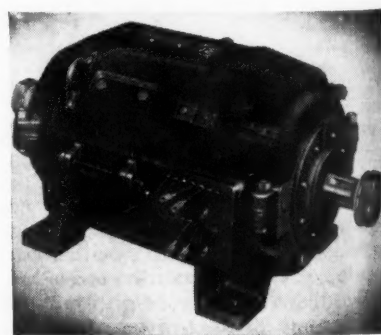
### Swivel Hook

Thomas Laughlin Co., Portland, Me., offers a new replacement swivel-hook assembly embodying Laughlin's recently improved safety latch. No machining, the company states, is necessary to install the swivel safety hook. All that is required is to unbolt the old assembly and bolt the new one on. The new assembly features the new improved safety latch on conventional styles of hoist hooks, which leaves 80 percent of the regular throat opening, and which will not

open until the operator releases the latch with his fingers. A graphite-impregnated washer under the nut is said to assure easy swivel action, while the heat-treated alloy swivel bolt provides maximum strength and long life.

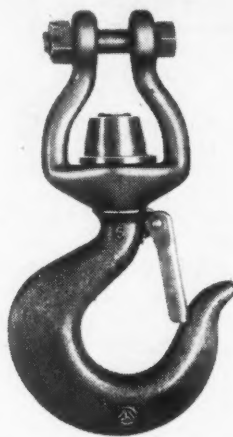
### Mill Motors

Westinghouse Electric Corp., Buffalo 5, N. Y., is now producing a new line of mill motors reduced one frame size, made possible, the company states, through a larger and more efficient armature that fits within the



limiting dimensions of the motor frame, new roller bearings and bearing housing, and redesigned field coils.

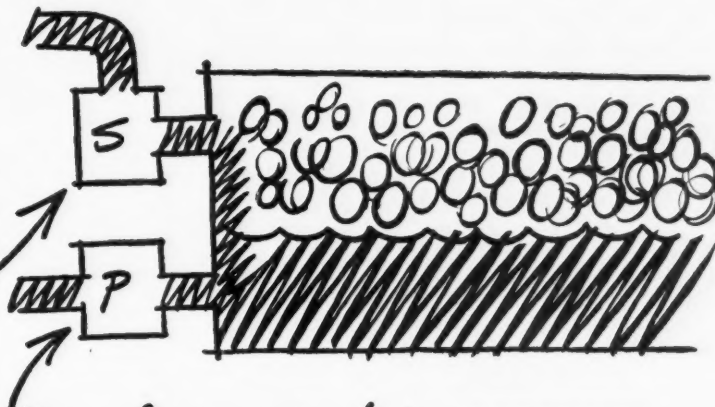
The heavy duty Type MC "Mill Motor" is available in totally inclosed, protected-self-ventilated or protected-forced-ventilated construction, in sizes from 5 to 200 hp.; voltages of 230 and 550; and AISE dimension frames 602 to 618. Among the features of the new motor cited by the manufacturer are: split frame of cast



# LUBE MEMO

*Air bubbles can wreck bearings*

*In our dry-sump system, air sucked through scavenging pump makes lube foam.*

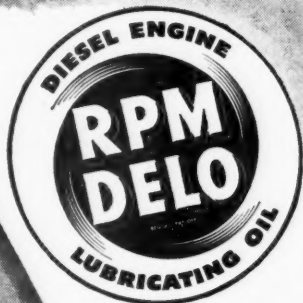


*When foam gets into pressure pump, it loses suction, pumps insufficient oil to bearings...!!*

*Rep. says RPM DELO Diesel Engine Lubricating Oil stops foaming—How??*

- 1. Special compounds in RPM DELO Oil minimize bubbles.*
- 2. Lab. tests prove bubbles that form break up immediately*

*Phone RPM  
DeLo Oil Rep.*



DISTRIBUTED BY  
**Gordon Lubricating Company**  
In Pennsylvania, Ohio, West Virginia, Kentucky  
1023 Oliver Bldg., Pittsburgh, Pa. At. 5172  
Andover Road, Columbus, Ohio  
Kingswood 1495

DISTRIBUTED BY  
**Transcentral Oil Corporation**  
In Indiana, Illinois, Missouri, Michigan  
600 S. Michigan Ave., Chicago, Ill.  
HAR. 2677  
Indianapolis, Ind. Market 1401



As we pause to wish all our friends a Merry Christmas, we are disturbed by thoughts of Old World conditions, poverty, hunger and death, the aftermath of war.

In a country like America, we and our families and friends can enjoy the spirit of Christmas. We only hope its message of Peace on Earth, Good Will toward Men will mean something to all the world.

And it will!

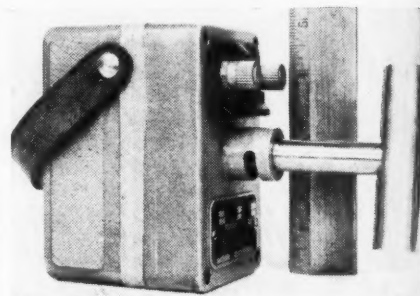
**STEARNS MAGNETIC MFG. CO.**

Milwaukee 4, Wis.

steel; silicone-insulated armature coil conductors; wedges of Class B material to hold coils in slots; new roller-bearing and bearing housing eliminating need of thrust washer and collars; improved field-coil insulation; and rigid mounting of brush holders.

### Blasting Magneto

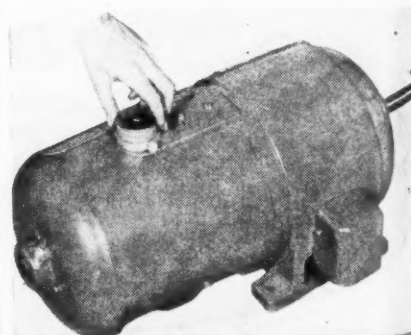
A new permissible 1- to 10-shot blasting magneto for all types of blasting operations has been developed by the Breeze Corporations, Inc., Newark 7, N. J. Its discharge, operating on the power stroke only, is



automatically limited to between 12 and 30 millise., and the design is such that a secondary explosion cannot occur, according to the manufacturer. An insulating rib prevents wires from shorting, while an exceptionally strong housing protects the drive shaft, thus eliminating accidental operation, it is said. Weighing 4½ lb., the unit has no commutator, brushes or rotor windings. A new magnet material used is said to retain full magnetism indefinitely.

### Electric Motor

A new line of Tri-Clad brush-shifting adjustable-speed induction motors, Type ACA, has been announced by the Motor Divisions, General Electric Co., Schenectady 5, N. Y. Available in ratings from 3 to 50 hp. (220, 440, and 550 volts), the new motor features stepless speed adjustment over a 3:1 ratio by simply turning a dial. The entire unit, with the exception of the starter control, is self-contained in a housing said to be only a little larger than that for a constant-speed motor of comparable rating. Remote speed control can be accom-





coil  
ma-  
new  
using  
asher  
l in-  
brush

-shot  
es of  
level-  
Inc.,  
oper-  
ly, is

en 12  
gn is  
a can-  
nufac-  
events  
except-  
ts the  
acci-  
ighing  
utator,  
A new  
retain

-shift-  
motors,  
ced by  
Electric  
able in  
0, 440,  
or fea-  
at over  
a dial.  
ception  
elf-con-  
only a  
nstant-  
rating.  
accom-

AL AGE



Wickwire's wire drawing dies are accurate within .0003 of an inch.

## In Rope Wire too—Reducing Methods Must be Safe

Making rope wire slim and strong is as scientific as any reducing method for humans—and a lot more certain of correct results. At the Wickwire plant, the size and sequence of wire drawing dies are carefully calibrated to provide for uniform reduction and to avoid the possibility of wire becoming brittle. Skipping of drafts, another cause of wire embrittlement, is eliminated by use of continuous wire drawing machines which will not function unless all dies are in their proper place.

Drawing, cleaning, heat treatment—every step necessary to reduce Wickwire Rope Wire to final size is closely supervised. The finished wire is accurate within a fraction of a thousandth of an inch. Production of strands and finished ropes is equally exacting.

All this adds up to Wickwire Rope being the logical choice of rope users who demand the utmost in performance, safety and long life. Wickwire Rope is available in all sizes and constructions, both regular lay and WISSCOLAY Preformed. Wickwire Distributors and Rope Engineers are always ready to help solve your wire rope problems and supply the right rope for your needs.

### HOW TO REDUCE ROPE COSTS AND PROLONG ROPE LIFE

Thousands of wire rope users have found that the information packed in the pages of "Know Your Ropes" has made their work easier. It's full of suggestions on proper selection, application and usage of wire rope. It's easy-to-read and profusely illustrated. For your free copy, write—Wire Rope Sales Office, Wickwire Spencer Steel, Palmer, Mass.



# WICKWIRE ROPE



A PRODUCT OF THE WICKWIRE SPENCER STEEL DIVISION OF THE COLORADO FUEL AND IRON CORPORATION

WIRE ROPE SALES OFFICE AND PLANT—Palmer, Mass.

EXECUTIVE OFFICE—500 Fifth Avenue, New York 18, N. Y.

SALES OFFICES—Abilene (Tex.) • Boston • Buffalo • Chattanooga • Chicago • Denver • Detroit • Emlenton (Pa.) • Fort Worth • Houston • New York • Philadelphia • Tulsa

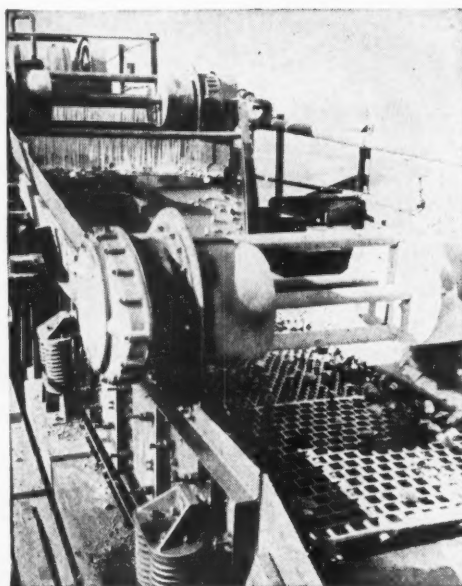
PACIFIC COAST SUBSIDIARY—The California Wire Cloth Corporation, Oakland 6, California

# Hendrick Perforated Metal Plate

... on ROBINS  
ELIPTEX SCREEN

Here is a Robins Eliptex Vibrating Screen equipped with a Hendrick perforated metal deck. The three-way motion of this well-known screen, plus the accuracy of Hendrick perforations, assures sharp sizing, high capacity and freedom from blinding.

Toughened by an exclusive Hendrick heat-treatment process, Hendrick perforated metal plate withstands abrasion and maintains uniformity of mesh throughout unusually long service life. It is furnished in any desired gauge and size of openings to meet specific requirements. Write for detailed information.



Perforated Metals  
Perforated Metal Screens  
Wedge-Slot Screens  
Mitco Open Steel Flooring,  
"Shur-Site" Treads and  
Armorgrids

## HENDRICK

*Manufacturing Company*

41 DUNDAFF STREET, CARBONDALE, PENNA.

Sales Offices In Principal Cities

DEPENDABLE PERFORMANCE *Always*  
Standard and Special Mine Track Work.



WEIR KILBY

For more than sixty years Weir Kilby has been manufacturing good quality trackwork for Railways, Mines, and Industrial plants. As rolling stock and other apparatus have become heavier we have improved and strengthened our product to meet these new service demands. Our many customers are pleased with our good deliveries, reasonable prices and superior product. We will be glad to work with you. Many items, such as TITAN Frogs, Switches, Switch Stands, etc., can be shipped from stock. Others will be made up promptly.



CATALOG "H" comprises 154 pages of helpful data, replete with photos, drawings and specifications, covers every track work need. A request on your letterhead will bring your copy promptly.

Suppliers to Mines and Railroads *Since 1882*

## WEIR KILBY CORPORATION

CINCINNATI 12, O.

BIRMINGHAM 7, ALA.

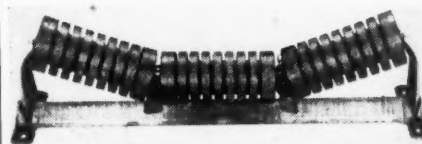
plished by use of a flexible cable shaft up to 10 ft. away from the motor. For complete remote control, a small pilot motor can be used to drive the speed control mechanism.

Uniform cooling with low intake velocity is provided by double-end ventilation, it is said. Necessary overload protection and limit switches to insure proper starting are built into the motor. The standard frames (225 to 505) have NEMA mounting dimensions. For resistance to oil and heat aging, Formex-wire stator windings are used.

The motor is rated on a constant torque basis, and according to the company, it will carry full-load torque at rated current and frequency without exceeding a temperature rise of 40 C. on high speed or 50 C. on low speed. Power factor is high when the motor is running at high speed. At synchronous speed, it is about the same as with a squirrel-cage induction motor of similar rating.

### Conveyor Idlers

A new-type impact-cushioning idler for belt conveyors, consisting of non-pneumatic rubber rings mounted on the idler core instead of the conventional rubber-covered idler, has been developed by the Goodyear Tire & Rubber Co., Akron, Ohio. With the new idler maximum deflection is about



six times greater, according to the company. With the high resiliency of the rubber rings, life of even top-quality belts is increased materially, doubled in some instances, Goodyear states.

The new device is an adaption of the use of pneumatic tires, mounted on shafts revolving in bearings, to protect the belt from shock of falling material at dumping points, and is designed for less severe applications that do not require the use of tires. Goodyear has contracted to make the molded rubber rings for several belt-conveyor equipment firms, it is understood.

### Diesel Engines, Units

A new four-cylinder diesel D311 engine, and a new D2 track-type tractor and a new No. 212 motor grader powered by it, have been placed in production by the Caterpillar Tractor Co., Peoria 8, Ill. The new units are said to reflect extensive engineering and manufacturing research resulting in motor and control design



le shaft  
tor. For  
all pilot  
he speed

intake  
able-end  
ry over-  
atches to  
ilt into  
es (225  
dimen-  
nd heat  
indings

onstant  
to the  
l torque  
y with-  
rise of  
on low  
hen the  
eed. At  
out the  
induc-

ng idler  
of non-  
nted on  
conven-  
as been  
Tire &  
ith the  
is about

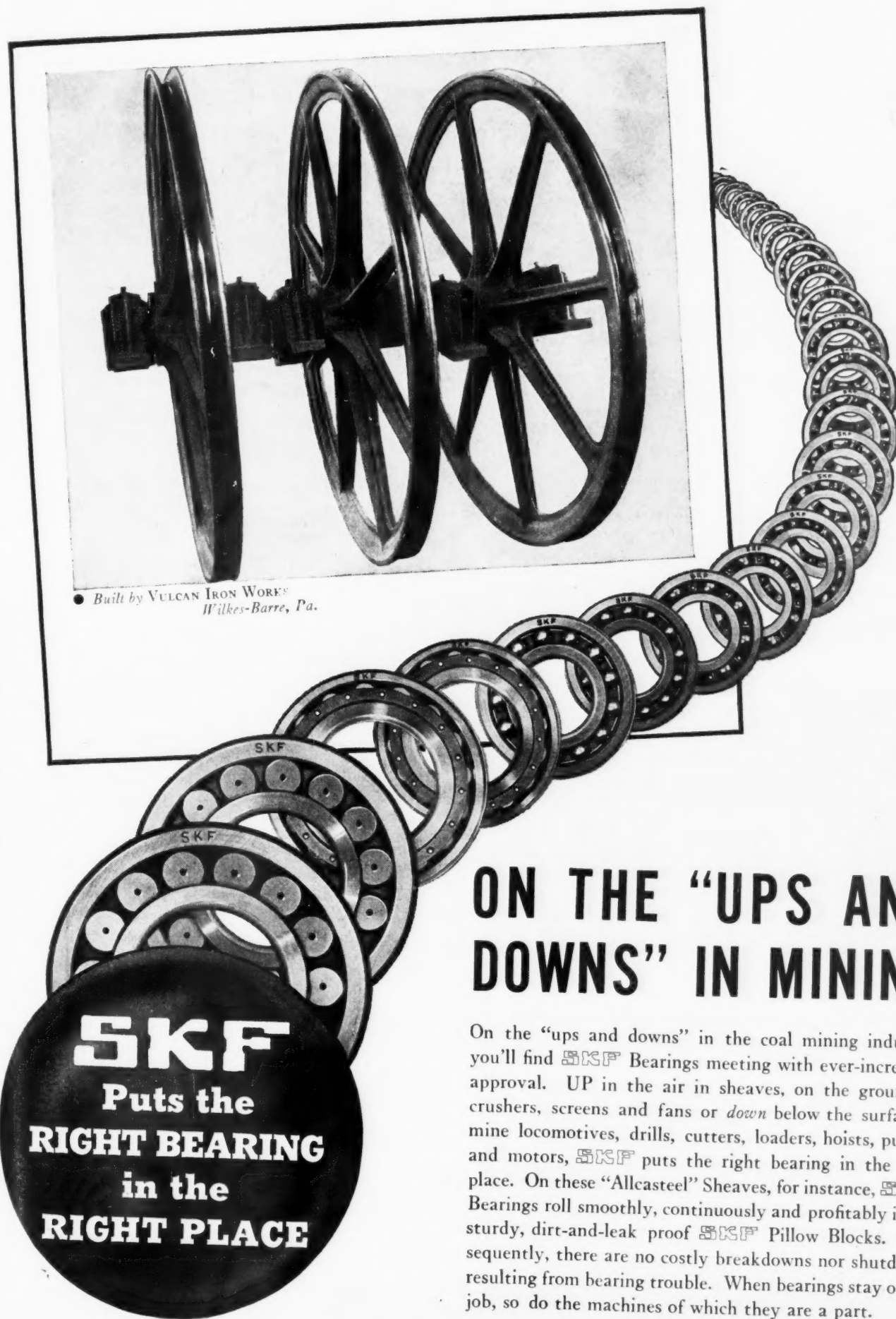


to the  
iciency of  
ven top-  
terially,  
oodyear

ption of  
mounted  
ings, to  
f falling  
and is  
lications  
of tires.  
ake the  
ral belt-  
s under-

el D311  
pe trac-  
grader  
laced in  
Tractor  
nits are  
ineering  
result-  
design

COAL AGE



● Built by VULCAN IRON WORKS  
Wilkes-Barre, Pa.

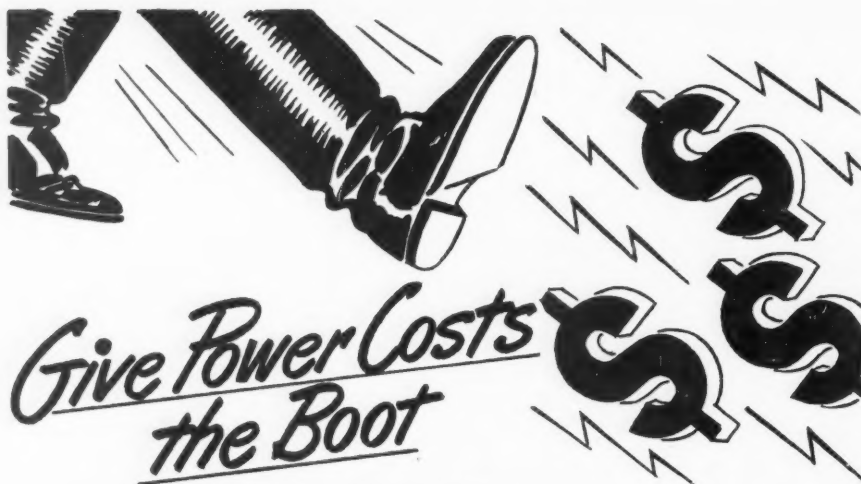
## ON THE "UPS AND DOWNS" IN MINING

**SKF**  
Puts the  
**RIGHT BEARING**  
in the  
**RIGHT PLACE**

On the "ups and downs" in the coal mining industry, you'll find **SKF** Bearings meeting with ever-increasing approval. UP in the air in sheaves, on the ground in crushers, screens and fans or *down* below the surface in mine locomotives, drills, cutters, loaders, hoists, pumps, and motors, **SKF** puts the right bearing in the right place. On these "Allcasteel" Sheaves, for instance, **SKF** Bearings roll smoothly, continuously and profitably inside sturdy, dirt-and-leak proof **SKF** Pillow Blocks. Consequently, there are no costly breakdowns nor shutdowns resulting from bearing trouble. When bearings stay on the job, so do the machines of which they are a part. 6361

**SKF** INDUSTRIES, INC., PHILADELPHIA 32, PA.





*Give Power Costs  
the Boot*

with **MESCOWELD RAIL BONDS**

Do away with excessive power costs resulting from faulty rail bonding... use Mescoweld Flashwelded Rail Bonds. Mescoweld Bonds do a better bonding job; at the same time they increase efficiency and insure perfect conductivity with constant, uniform power.

18 types of Flashwelded Rail Bonds comprise the Mescoweld line. There is a type perfectly suited to your bonding job. Write for complete information.

Type M-8F  
all-purpose bond



**MOSEBACH ELECTRIC & SUPPLY CO.**

1115 Arlington Avenue, Pittsburgh 3, Penna.

Phone: HE mlock 8332

**FLEXIPIPE**

The improved flexible tubing for  
mine and tunnel ventilation

This flexible air tubing is ready for immediate, easy installation. On account of its flexibility, it can be put up or taken down in a fractional part of the time required by more rigid means of face ventilation.

Write for free sample and full information.

**BEMIS BRO. BAG CO.**

412 Poplar Street, St. Louis 2, Mo.

**MORE HAULAGE FOR 20% LESS BATTERY CAPACITY**

Double knee-action; better trackability. Floating power; less power consumption. Quick acting footbrake — essential for quick stopping, especially behind loading machines. Brake shoes that follow wheels (due to knee-action). Adjustable Timken Bearings throughout.



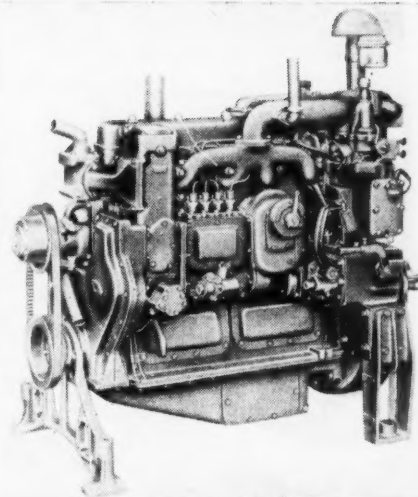
Huskiest transmission in any storage battery locomotive. Oil-tight; leakproof. Use regular auto oil; change every 6 months. Strong. Simple design. Low maintenance cost. Backed by over 25 years of experience with Storage Battery locomotives.

**GREENSBURG "MONITOR"**

Franklin County Coal Corporation at Royalton and Herrin, Illinois, have 12 of our Monitor type, storage battery locomotives.

All Greensburg Locomotives are CUSTOM-BUILT to your requirements

**THE GREENSBURG MACHINE CO. 101 STANTON ST. GREENSBURG, PA.**



changes and the use of improved materials, and offer marked power increases over the models they replace.

The new D311 engine, focal point of the increased power in the tractor and motor grader, replaces the D3400 in the company's line and is available as an industrial power unit, an electric set and a marine engine. It develops a maximum output, with radiator fan and full equipment, of 49 hp., at 1,700 r.p.m. In addition to improved connecting rods, crankshaft, manifold, oil pressure and lubricating systems, fuel injection valves, governor, etc., the bore has been increased by 1/4 in., from 3 3/4 to 4 in., resulting in an increase to 252 cu.in. in piston replacement.

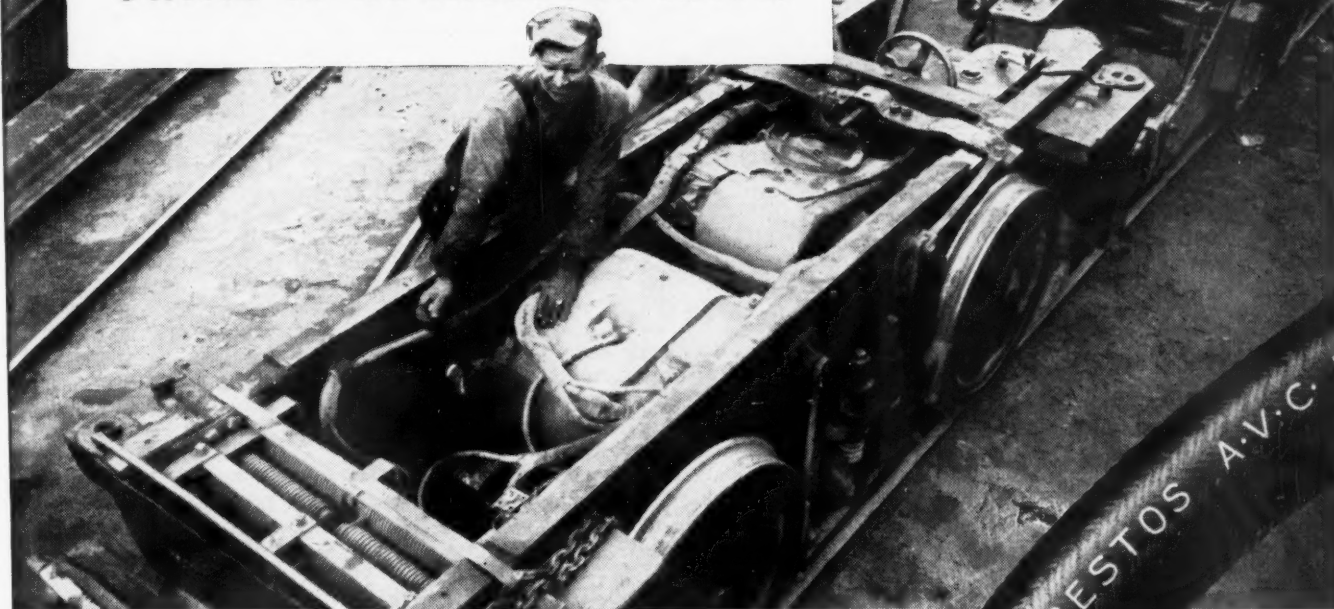
The D2 tractor has 32 drawbar-horsepower and 38 belt-horsepower, a 24-percent increase over the model it replaces. The diesel No. 212 motor grader, at 45 hp., shows a 29-percent increase in power over the previous model of this size and weight. Other features cited by the manufacturer include anti-coasting brakes, increased speed and an arched front axle to provide maximum clearance.

**Respirator**

A new respirator incorporating a new dust filter for protecting workers against poisonous and disease-producing dusts smaller than a 24 millionth of an inch has been announced by the



## When Internal Cable Failures "Sidetrack" Your Locomotives Switch to ROCKBESTOS A.V.C.



You lose more than top tonnage when locomotives are laid up by cable failure. Profits are *sidetracked* too—just because the internal wiring couldn't take the heat of resistor grids, overloads and other severe operating conditions.

One way to get the tonnage you *want* is to install the cable you *need*. Note these two "made-for-the-job" advantages of Rockbestos A.V.C.—especially important in keeping locomotives, cutters and loaders working full-time:

- (1) A braid that is highly resistant to heat, moisture, oil, grease and alkalis—one that won't burn or carry traveling wire-fires.
- (2) An age-resistant mineral insulation of felted asbestos that won't bake out or crack under heat and vibration—and won't ignite under an arc.

Wherever the going is hot or overloads are heavy, install Rockbestos A.V.C. for more tonnage, greater safety and reduced maintenance. Use it for motor leads, coil and grid connections. Write for a cut-back sample of the cable and a copy of Bulletin 30-C.

**ROCKBESTOS PRODUCTS CORPORATION**  
Dept. M-8, P. O. Box 1102, New Haven 4, Conn.

# ROCKBESTOS A.V.C.



**The Cable with Permanent Insulation**

**ORDER FROM THESE JOBBERS—SPECIFY "ROCKBESTOS A.V.C."**

BECKLEY, W. VA.: Beckley Mach. & Elec. Co.	EVANSVILLE, IND.: Evansville Elec. & Mfg. Co.	PITTSBURGH, PA.: Upson-Walton Co.
BIRMINGHAM, ALA.: Moore-Handley Hdwe. Co.	FAIRMONT, W. VA.: Fairmont Supply Co.	Westinghouse Elec. Supply Co.
BLUEFIELD, W. VA.: Superior-Sterling Co.	HUNTINGTON, W. VA.: Banks-Miller Supply Co.	Penn. Elec. Engineering Co.
CHARLESTON, W. VA.: Charleston Elec. Supply Co.	LOTHAIR, KY.: Mine Service Co.	WHEELING, W. VA.: Westinghouse Elec. Supply Co.
CLEVELAND, OHIO: Upson-Walton Co.	MIDDLESBORO, KY.: Rogan & Rogan Co.	WILLIAMSON, W. VA.: Williamson Supply Co.

**Construction Features  
of the Original  
ROCKBESTOS A.V.C.  
that mean Longer,  
Dependable Service**

Made to fit bushings properly.

Impregnated asbestos yarn braid is heatproof, flameproof and resistant to moisture, oil, grease and alkalis.

Felted asbestos insulation beneath, impregnated with heat, flame and moisture resisting compounds like the braid, won't bake out, crack, flow or burn.

Asbestos-protected varnished cambric supplies high dielectric strength and added moisture resistance.

Inner impregnated asbestos insulating wall won't get brittle or crack under conductor-heating overloads and won't burn even if the copper melts.

Paper separator prevents insulation from sticking to the conductor, makes stripping easy.

*This construction is one of 125 developed by Rockbestos for severe operating conditions.*



# MINE ACCIDENTS know no season



Winter . . . spring . . . summer . . . fall, mine accidents know no season. And neither do Bituminous Safety Engineers. For they are "on guard" constantly, striving to help save lives, and reduce the frequency and severity of accidents in the mines of Bituminous Workmen's Compensation policyholders. To do this, Bituminous Safety Engineers maintain an exhaustive safety program involving regular mine inspections . . . analysis of hazards . . . recommendations based on surveys . . . accident prevention activities . . . reduction of operating expenses resulting from accidents . . . and establishment of production efficiency. The safety program benefits extend not only to the mine workers but operators and mine owners as well.

With Bituminous Workmen's Compensation insurance, you are protected against mine accidents . . . you get "SECURITY WITH SERVICE".

**Assets Over \$18,000,000**

**BITUMINOUS CASUALTY  
CORPORATION**  
ROCK ISLAND ILLINOIS

**OVER 30 YEARS  
OF SERVICE TO THE INDUSTRY**

American Optical Co., Southbridge, Mass. First of its kind, according to the company, the new filter consists of a felt chemically treated so that its ability to prevent the passage of dust is 40 times greater than that of untreated filters. Approved by the U. S. Bureau of Mines, the new AO R-2000 respirator and filter is stated to be substantially smaller and lighter, with a larger field of vision. To prolong its life, the filter is equipped with a gauze pre-filter, said to be easily changed.

## Wetting Agent

A new product known as "Pentrate" which, when added to water, is said to make water wetter and more penetrating for fire fighting, has been developed by the America-LaFrance-Foamite Corp., Elmira, N. Y. One part of Pentrate to 100 parts of water, according to the manufacturer, acts to free surface tension, giving it a better chance to spread, penetrate and soak into the object on fire and is particularly effective on stubborn, deep-seated smoldering fires. It is no more injurious to wood or metals than water itself.

## Trade Literature

Available Without Charge on  
Request to the Manufacturer

**Electric Motors**—The Louis Allis Co., Milwaukee 7, Wis. Bulletin No. 516-D describes the line of Type CT rolled-shell shaftless squirrel-cage induction motors for built-in drives, and covers details of electrical and mechanical features, mounting, ventilation and applications.

**Magnetic Pulley**—Dings Magnetic Separator Co., 4740 West McGeogh Ave., Milwaukee 14, Wis. Bulletin describes the new Perma-Pulley, a permanent alnico magnetic head pulley for belt-conveyor systems, for removal of tramp iron. Dimensions, capacities, weights and other specifications and design of the unit are included.

**Electric Motor**—Fairbanks, Morse & Co., 600 South Michigan Ave., Chicago 5. Bulletin No. AEB 210.1 describes the design, characteristics and applications of the new Fairbanks-Morse Axial Air-Gap motor.

**Lubrication**—The Texas Co., 135 East 42nd St., New York 17. December issue of Texas Co. *Lubrication* magazine contains an illustrated technical article entitled, "Flow Properties of Lubricating Greases—Relationship of Apparent Viscosities."

**V-Belt Sheaves**—American Gear & Mfg. Co., 5900 Ogden Ave., Chicago 50. Bulletin No. 305 supplies design information, full specifications and prices on the company's line of V-



## Dings Rectangular Suspended Magnets Give You **MAXIMUM** Tramp Iron Removal!

Here's far more magnetic strength and penetration than is possible with ordinary magnets. If you're going to take the iron out, why put up with anything less? Dings Rectangular Suspended Magnets can be built in any length . . . to pick up iron at any belt speed! Flux pattern across face of magnet is even—no dead spots—which allows use of a magnet no wider than burden width. Will attract larger pieces of iron at distances up to 14 inches. Simple to install . . . low operating cost . . . negligible maintenance because of no moving parts . . . here's a magnetic separator you need to protect your machinery and screens, and your customers' stokers, from the ravages of tramp iron.



**NEW CATALOG!** Dings new catalog No. 301-A gives complete data on "High Intensity" Rectangular Magnets. Write for it today.

**DINGS MAGNETIC SEPARATOR CO.**  
4720 W. McGeogh Ave., Milwaukee 14, Wis.

Separation Headquarters  
Since 1899

**Dings**  
"HIGH INTENSITY"

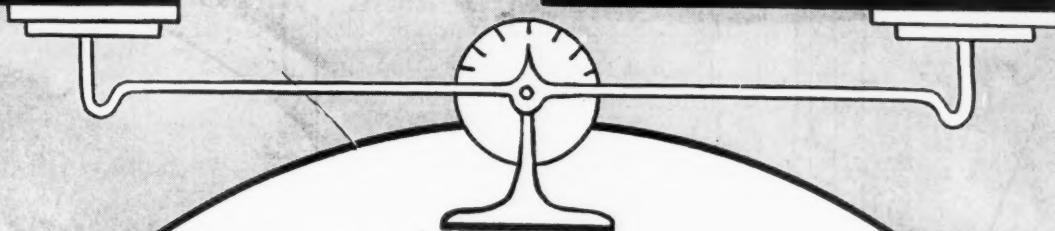


COMPARE A

ONE  
CU. YD.  
CARRYING  
CAPACITY

*Page Automatic*

WITH YOUR  
PRESENT DRAGLINE BUCKET  
ONE CU. YD. RATED CAPACITY



The Page AUTOMATIC has always been built large enough to make the carrying capacity *equal* to the rated capacity size. A one cubic yard Page bucket will load and carry one cubic yard of material—but many buckets rated at 1 yd. cannot do it. A bucket with a struck measure of less than 31.8 cu. ft. cannot possibly average a one cu. yd. payload.

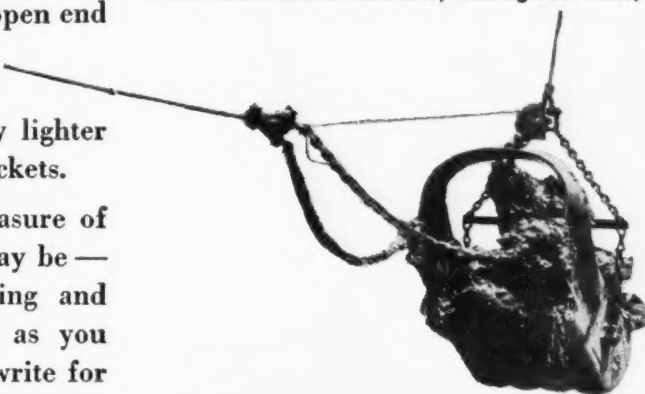
Ordinary buckets do not have sufficient allowance for the curved portions and the open end and, therefore, carry as low as  $\frac{3}{4}$  or  $\frac{1}{2}$  as much material as the rated capacity indicates. That's another reason why lighter weights are claimed for ordinary buckets.

We suggest checking the struck measure of your bucket — whatever the size may be — to actually see if you are loading and carrying out as much material as you should be. Ask your dealer or write for new booklet "How to Get the Most Out of a Page AUTOMATIC Dragline Bucket" which includes

the listings of minimum struck measurements required in all size buckets for the *true* capacity rating.

No matter if you need a perforated — slat — or regular dragline bucket — get a Page AUTOMATIC—they're the lightest and sturdiest made and are guaranteed to outdig any other dragline bucket at any depth.

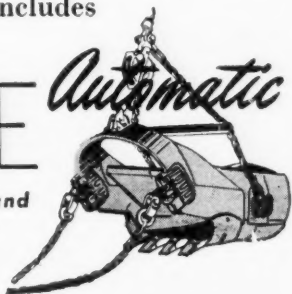
PAGE ENGINEERING COMPANY, Clearing Post Office, Chicago 38, Ill.



**PAGE**

*Automatic*

DRAGLINE BUCKETS and  
WALKING DRAGLINES



**PAGE ENGINEERING COMPANY**

Clearing Post Office  
Chicago 38, Ill.

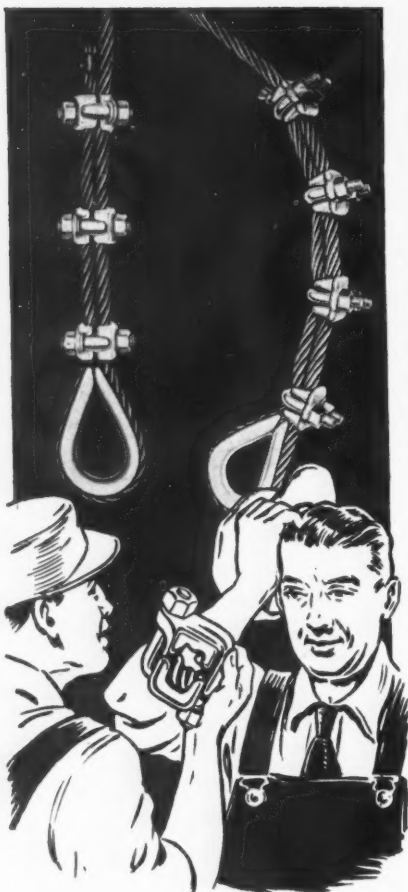
Please send me a copy of your new 20-page booklet  
"How to Get the Most Out of a Page AUTOMATIC  
Dragline Bucket."

Name.....

Firm.....

Address.....

City.....Zone.....State.....



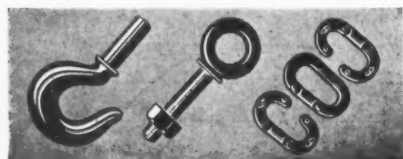
## "Get This Straight"

"A bowed rope is a weakened rope, Mac . . . those 'Finger Pinch' U-Bolt Clips crush and bend the rope . . . make the load *uneven* — some strands are overloaded . . . others don't carry their proper load. Results: premature rope failure . . . higher rope costs . . . lessened efficiency. Replace 'em with Laughlin 'Fist-Grip' Clips — they'll make your rope straight like *this* one, because their flat bearing surfaces give uniform pressure over the entire contact area. 'Fist-Grips' are easy to put on, too, Mac . . . even new men like yourself get 'em right the first time because they come in identical halves — you *can't* stagger 'em. Furthermore, three 'Fist-Grips' do the work of four U-Bolts, so you save time. Ask the Supply Room boys for 'Fist-Grips' . . . they prevent many a headache."

"Fist-Grip" Clips are available at your supply house. Look for the "L" trade-mark. Write for fitting catalog: Dept. 6, The Thomas Laughlin Co., Portland 6, Maine.

**LAUGHLIN**

THE MOST COMPLETE LINE OF DROP-FORGED WIRE ROPE AND CHAIN FITTINGS



belt sheaves and also lists prices and sizes for its V-belt line.

**Testing Equipment**—General Electric Co., Apparatus Dept., Schenectady 5, N. Y. Catalog, "Specialized Testing and Measuring Equipment," describes and illustrates, with specifications and prices, more than 90 units designed to test, for example, time, speed, torque, force, strain, resistance and insulation, vibration and sound, electrical circuits, etc.

**CO<sub>2</sub> Indicator**—Burrell Technical Supply Co., 1942 Fifth Ave., Pittsburgh 19, Pa. Bulletin No. 206 illustrates and describes the construction and operation of the Burrell CO<sub>2</sub> Indicator and the CO<sub>2</sub> Indicator Kit.

**Air-Drill Hose**—Hewitt Rubber Division, Hewitt-Robins, Inc., 240 Kensington Ave., Buffalo 5, N. Y. Folder on the Monarch and Ajax brands of Hewitt air-drill hose, designed for heavy-duty service in mines and quarries where resistance to hot oils and abrasion is especially important, outlines the use and construction of the hose.

**Worm Gearing**—De Laval Steam Turbine Co., Trenton 2, N. J. Bulletin No. WG 1220-5-46 describes and illustrates use and construction of De Laval worm gearing, and includes information on AGMA service classification, bearing load formulae, selection practice, horsepower ratings, worm thread and gear tooth data for different ratios, dimensions and details of standard worm mountings, worm dimensions, gear dimensions and dimensions of standard flanged rims.

**Conveyor Idlers**—Robins Conveyors Division, Hewitt-Robins Inc., Passaic, N. J. Bulletin No. 120-A1 covers various features of Robins idlers, their construction and application, and contains information helpful in laying out a belt-conveyor system.

**Air Compressor**—Schramm, Inc., West Chester, Pa. Bulletin No. FC-48 illustrates and describes application of the new Schramm No. 60 Crawler, a crawler-mounted air compressor that features quick, easy shifting on the job. Various attachments available, together with the unit's self-motive power, are said to make it applicable to a variety of jobs.

**A.C. Control**—Ward Leonard Electric Co., 31 South St., Mt. Vernon, N. Y. Bulletin No. 4451 fully describes and illustrates the new Size 1 A.C. solenoid contactor—said to be the first of a complete new line of Ward Leonard a.c. control equipment.

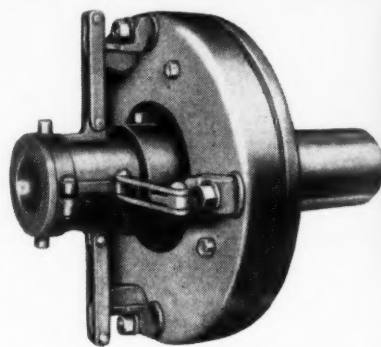
**Sheaves and Pins**—The Tool Steel Gear & Pinion Co., Cincinnati 16, Ohio. Bulletin No. 947 discusses the features, construction and application of the company's "Tool Steel Process" sheaves and pins.

**Scrapers**—La Plant-Choate Mfg. Co., Inc., Cedar Rapids, Iowa. Sepa-

## KEEP POWER UNDER CONTROL



## KINNEY INTERCHANGE CLUTCH



Controlled power is useful power — install a Kinney Clutch for safety . . . and savings, too. Power may be instantly disconnected, smaller motors can be used to start heavy loads, and equipment life is lengthened. The Kinney Interchange Clutch is smooth and rugged . . . it transmits power directly through flat discs and not through bolts or engaging mechanism. Widely used on slow speed auxiliary equipment, hoists and winches. Available solid, or split construction for easy installation; capacity 2 to 40 H.P. per 100 R.P.M. Write for Catalog K-8 describing the full line of Kinney Clutches.

### KINNEY MANUFACTURING CO.

3525 WASHINGTON STREET,  
BOSTON 30, MASS.

NEW YORK • CHICAGO • PHILADELPHIA  
LOS ANGELES • SAN FRANCISCO

We also manufacture Vacuum Pumps, Liquid Pumps and Bituminous Distributors

# for CONTINUOUS TROUBLE FREE *Resistor* SERVICE



- ★ ALL STEEL CONSTRUCTION
- ★ MICA INSULATION
- ★ RUGGED TERMINALS
- ★ PROVISION FOR EXPANSION
- ★ ADEQUATE VENTILATION
- ★ UNAFFECTED BY VIBRATION
- ★ MOISTURE RESISTANT
- ★ CORROSION PROTECTED

**Steel Grid Resistors  
for COAL MINES  
Since 1915**



Steel and Mica, the two basic materials entering the construction of P-G Steel Grid Resistors, are the foundation for continuous trouble free resistor service. P-G uses these materials in a unique design to provide both for expansion and for maximum ventilation.

*The Nonbreakable Steel Grid Resistor*

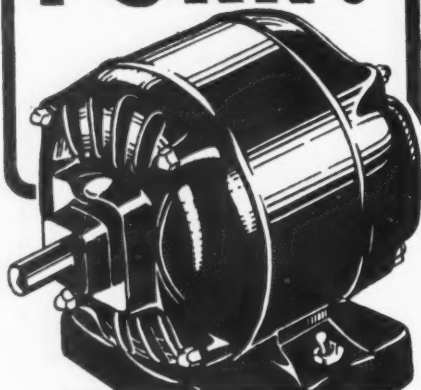
**THE POST-GLOVER ELECTRIC COMPANY**

• ESTABLISHED 1892 •

221 WEST THIRD STREET, CINCINNATI 2, OHIO



## WHAT MAKES A MOTOR PURR?



"WHY, PROPER  
COMMUTATION  
OF COURSE!"



## OHIO MOTOR BRUSHES ARE THE ANSWER...

COMMUTATION is the most important function of a motor brush. Obviously, conditions encountered below earth level, at earth level, or in the stratosphere will effect proper commutation. Location, humidity, temperature, dust and fume conditions, over-load and under-load are as important as the machine itself. *Identical motors and generators often do not give identical performance.* Address your COMMUTATION Problems to our Engineering Staff.

BUY YOUR  
CARBON BRUSHES  
FROM A  
SINGLE  
SOURCE

**THE OHIO CARBON  
COMPANY**

12508 BEREA RD., CLEVELAND 11, OHIO

rate pamphlets illustrate and describe La Plant-Choate's hydraulic and cable-operated scrapers. The hydraulic-scraper pamphlet shows action pictures of the company's 4-yd. scraper at work on a variety of jobs, covering both the two-wheel scraper and the four-wheel scraper. The cable-operated-scraper booklet describes and illustrates job applications of these scrapers, now available in 6-, 8- and 14-yd. capacities.

**Tape**—B. F. Goodrich Co., Akron, Ohio. Catalog section describes the construction and uses of the Goodrich "Two-in-One" tape that "weather-seals" electrical splices in one operation, its friction tape and splicing compound.

**Magnetic Separator**—Eriez Mfg. Co., 2990 East 12th St., Erie, Pa. Bulletin No. 102-B, entitled "Blueprint for Tramp Iron Removal," discusses magnetic equipment designed for industrial processing lines and includes specific applications, specifications and engineering data.

**Diesel Tractors**—Caterpillar Tractor Co., Peoria 8, Ill. Bulletin No. 10280 illustrates how diesel track-type tractors, equipped with bulldozers, scrapers, wagons or loaders; wheel-type tractors equipped with scrapers, diesel motor graders; and diesel engines and diesel-electric sets are utilized for digging, stripping, loading, land clearing, hauling and haul-road building and maintenance operations in several different industries.

**Corrosion - Resistant Alloys**—The H. M. Harper Co., 2620 Fletcher St., Chicago 18. "Harper Computer of Corrosion Resistance" for judging corrosion resistance of non-ferrous and stainless-steel alloys is made up in an easy-to-operate "slide-rule" form. The resistance of 13 non-ferrous and stainless-steel alloys in 142 corrosive applications are classified as excellent, good, fair or no good.

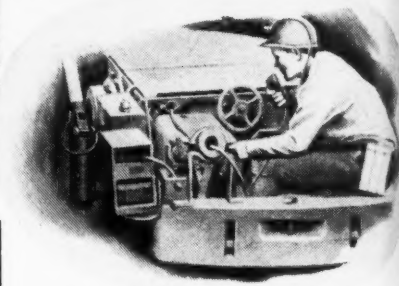
**Concrete Waterproofing**—Sika Chemical Corp., 35 Gregory Ave., Passaic, N. J. Pamphlet, "Fight Water," describes methods and products used to solve water problems in concrete and masonry construction and covers new construction for concrete, mortar, surface-protection and joints, with highlights on maintenance and repair problems.

**Tubing Circuits**—The Parker Appliance Co., 17325 Euclid Ave., Cleveland, Ohio. Handbook on the selection, sizing, layout and installation of metal-tubing circuits, entitled "Tube Fitter's Manual," makes available basic data for the design and speedy installation of such systems.

**Paints, Preservatives**—Inter-Coastal Paint Corp., East St. Louis, Ill. Brochure commemorating the company's 25th year outlines the growth and development of Inter-Coastal, with emphasis on its experience in perfecting

## TROLLEY PHONE

... talk between  
dispatcher and  
as many moving  
or stationary  
points as needed

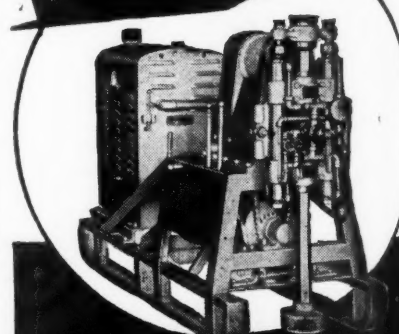


The FEMCO Trolley Phone saves time, saves money, promotes safety. Small compact design of equipment permits installation anywhere. Designed and engineered for heavy duty. All plug-in units for ease of service.

Phone, write or wire for further details.

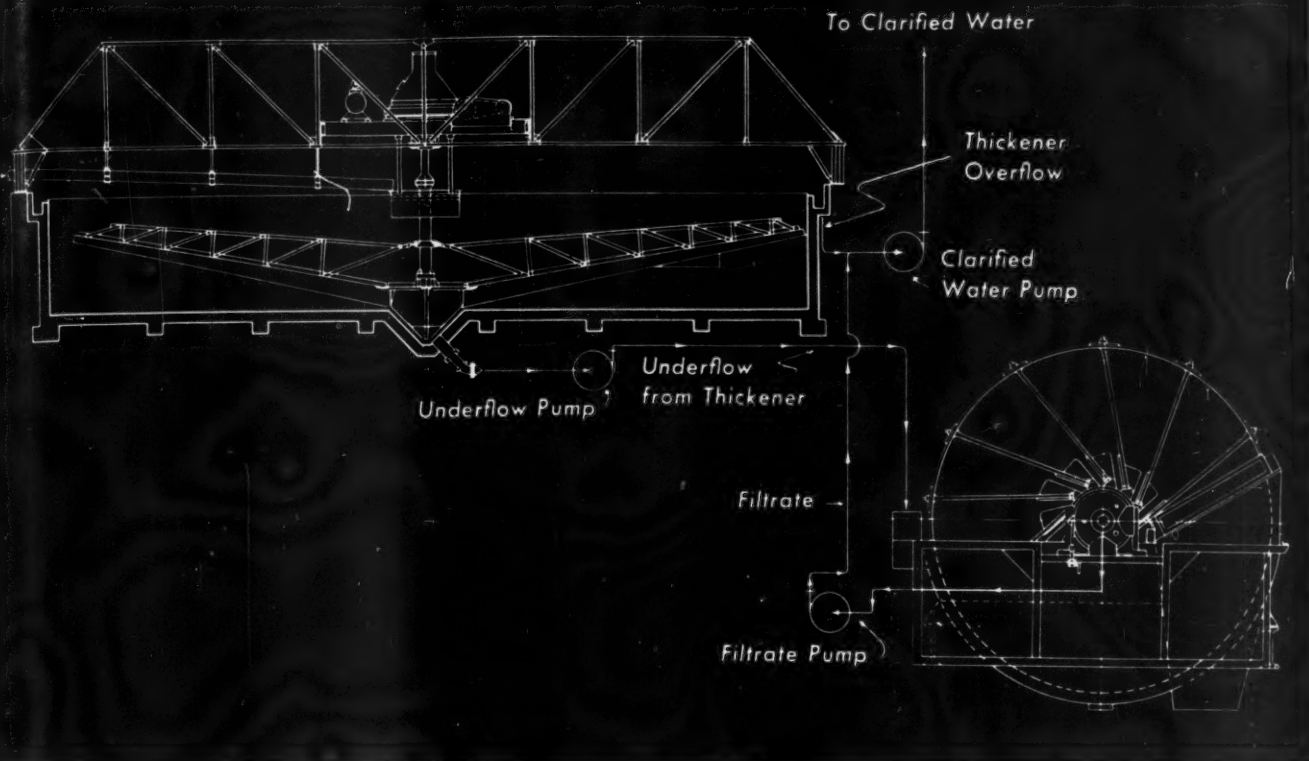
**FARMERS ENGINEERING AND MFG. CO.**  
549 Brushen Ave. Pittsburgh 21, Pa.

**Diamond  
Core  
Drilling**  
CONTRACTORS



Testing mineral properties  
with our light gasoline drills.  
**SATISFACTORY COAL CORES  
GUARANTEED.** Ground solidi-  
fication by our pre-pressure  
grouting method for shafts.  
Wetmine areas, horizontal  
holes for drainage. Electric  
drills for inside mine drilling.

**MOTT CORE DRILLING CO.**  
HUNTINGTON • WEST VIRGINIA



## *An Efficient Team* For a FINE COAL DEWATERING PLANT

The system illustrated, or one providing for further concentration, will soon have to be a part of every modern coal washing plant.

As designers and builders of thickeners, hydro-separators and vacuum filters—important elements of a fine coal dewatering plant—General American can recommend the equipment best suited to the particular problem involved—for some, the elimination of stream pollution; for others, the recovery of marketable coal.

The Thickener and the Filter both have distinctive features of design and construction. The new General American Conkey tangential disc vacuum filter has a higher capacity than any other rotary disc vacuum filter.

The General American Thickener or Hydroseparator is the most completely automatic and fool-

proof thickener now available. The hydraulic lift makes a virtually "choke proof" machine, permitting shut-downs without recirculation and starting under full load. The thickener will never stall in the event of power failure. Where operation is such that surges of fine coal occur, the thickener will handle them automatically. It also provides the highest underflow density without danger of stalling or choking the machine, thus raising the efficiency of the filter operation.

Because both units are designed, precision built and placed in operation by one organization—under one contract and one responsibility—a more efficient installation is assured.

Let a General American resident engineer in the coal field assist you in designing new units or modernizing your existing equipment.

*General American*  
TRANSPORTATION CORPORATION  
process equipment • steel and alloy plate fabrication

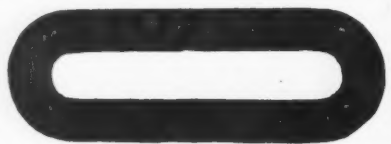
SALES OFFICE: 10 East 49th St., Dept. 810a, New York 17, N. Y.

WORKS: Sharon, Pa., East Chicago, Ind.

OFFICES: Chicago, Sharon, Louisville, Orlando, Washington, D. C.  
Pittsburgh, St. Louis, Salt Lake City, Cleveland.



## FOR SAFETY'S SAKE, SUPERIOR COUPLINGS



### Drop Forged Links

Drop forged for strength, Superior Swivel and Single Link Couplings are built to stand the gaff. No welds to let go with resulting wrecks. Superior Couplings on your mine cars will prevent accidents and reduce haulage costs. Order Superior Couplings for your replacements and specify them on new equipment.

### DROP FORGED SWIVEL COUPLINGS



## PITTSBURGH KNIFE & FORGE CO.

1421 Reedsdale St., N.S.  
Pittsburgh 12, Pa.



### "World's Largest" Dragline Bucket Goes Into Coal Service

SAID TO BE the world's largest, this 30-cu. yd. automatic dragline bucket recently built by the Page Engineering Co., Chicago, is being delivered to the strip mines of the Northern Illinois Coal Corp., Wilmington, Ill., for use on a Marion 7800 dragline.

"tailor-made" materials to meet the specific needs of various industries. Products covered include paints, varnishes, special finishing materials, and rot- and mildew-proofing agents for preserving wood and fabrics.

**Metallizing**—Metallizing Engineering Co., Inc., 38-14 30th St., Long Island City 1, N. Y. October issue of Metco News stresses the importance

of metallizing as a maintenance tool and includes articles by users on "how to do it."

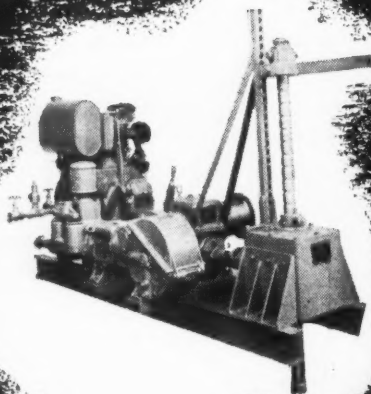
**Cable Connectors**—Mines Equipment Co., Dept. 2, 4212 Clayton Ave., St. Louis 10, Mo. Bulletin No. MC107 illustrates and describes the company's line of cable connectors, receptacles, safety circuit centers and power distribution systems.

## Industrial Notes

**Jeffrey Mfg. Co.**, Columbus, Ohio, which is celebrating the 70th anniversary of its founding this year, held its annual "Twenty Year Service Club" banquet Oct. 25. Established in 1920 with 137 charter members, the club at present numbers 685 "Old Timers" who have been associated with the company for more than 20 years, 15 of whom have more than 50 years' service. Membership of the club totals about a fourth of the company's total personnel. Entertainment at the banquet, for the second year running, was provided by talented Jeffrey employees.

**I-T-E- Circuit Breaker Co.**, Philadelphia, Pa., has acquired the **Railway & Industrial Engineering Co.**, Greensburg, Pa., through a transfer of stock, effective Nov. 1. It is presently planned that the two companies will continue to make their present products, under their established names and with their personnel practically unchanged. W. M. Scott Jr., president of I-T-E-, has become president of both companies. B. W. Kerr, formerly president, and K. S. Nevin, vice president, treasurer and general manager of R&IE, have been named directors of I-T-E-. Mr. Kerr also will be chairman of the executive committee of the I-T-E board, as well as chairman of the R&IE board.

## CORE DRILLING FOR COAL



Keep down cost per foot by using Acker light-weight, sturdy core drills—simple to operate and easy to move in rough country.

\*\*\*\*\*

Ideal for determining nature and depth of over-burden before strip mining. Accurate cores of coal seams by using single or double tube core barrels. Will operate diamond—alloy—steel shot bits.

\*\*\*\*\*

Choice of mountings—trailer—truck—drag skid.

\*\*\*\*\*

Drill tools and equipment for coal and mineral prospecting and All subsurface exploration.

\*\*\*\*\*


Send for literature

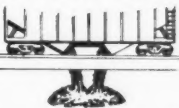
**ACKER DRILL CO. SCRANTON 3, PA.**






# Speed winter turnaround of cars with coal's best anti-freeze!

## "PASS the SALT"

Each winter more and more coal mine operators treat coal with **STERLING** Rock Salt to prevent freezing in transit. 

For coal delivered frozen at customers' yards must be unfrozen for unloading. 

Return of cars to mines is severely delayed and - with the national car shortage - everyone suffers, from consumer to miner! **STERLING**

Rock Salt  serves at the mines, too,  by removing snow and ice from roads, scales, tracks, platforms - helping prevent accidents,  delays.

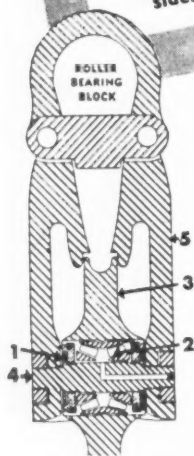
Write today for folder  telling when and how to use **STERLING** Rock Salt!

*International Salt Company, Inc. Scranton, Pa.*



# 5 REASONS why MORE and MORE MINE OPERATORS SPECIFY SKOOKUM SLUSHER BLOCKS

1. SKOOKUM'S PATENTED BEARING ADJUSTMENT and locking device makes on-the-job maintenance easy, seals out moisture.
2. TIMKEN TAPERED roller bearings . . . free running, heavy duty, sealed against dirt and moisture.
3. MANGANESE STEEL SHEAVES . . . non-wearing . . . will not wear cables.
4. CENTER PIN . . . tempered, stress-tested steel.
5. ANNEALED CAST STEEL sides for extra strength.



More and more mine operators are learning that it costs less to use Skookum Slusher Blocks. Make a trial order of Skookum blocks. Test them. Compare them. You, too, will agree that Skookum is a better slusher block by at least 5 counts.



WRITE FOR  
COMPLETE  
CATALOG



**SKOOKUM Co. Inc.**  
8504 N. CRAWFORD STREET  
PORTLAND 3, OREGON

Heyl & Patterson, Pittsburgh, Pa., has acquired the patents and business of The Thorsten Sampler Co., Pittsburgh, Pa., and will market the Thorsten Automatic Sampler. The company also has acquired the exclusive right to make and sell the Kinney mechanical car unloader for unloading hopper cars, designed by S. P. Kinney Engineers, Pittsburgh.

Gorman-Rupp Co., Mansfield, Ohio, has appointed H. W. Vine manager of industrial sales. Mr. Vine formerly was general sales manager of the Carver Pump Co., Muscatine, Iowa.

American Hoist & Derrick Co. has named Lee S. Coulter, associated with the company for 18 years, manager of its industrial sales division.

Fairbanks, Morse & Co., Chicago, has announced the following changes in sales organization: J. C. Elmburg, manager of the Boston branch, has been transferred to the company's Atlanta, Ga., branch as manager of that area, replacing G. N. Van Epps, recently resigned. V. O. Harlness, formerly manager of the diesel division at Chicago headquarters, has been named manager of the Boston branch and T. M. Robie of Chicago has been appointed manager of the general diesel sales division.

Coffing Hoist Co., Danville, Ill., has named Robert A. Thompson a district sales manager. He was formerly associated with Kennametal, Inc., as district manager.

Federal Electric Products Co., Newark, N. J., has named Robert C. Graves vice president in charge of sales. Mr. Graves was formerly vice president in charge of sales of the Trumbull Electric Mfg. Co.

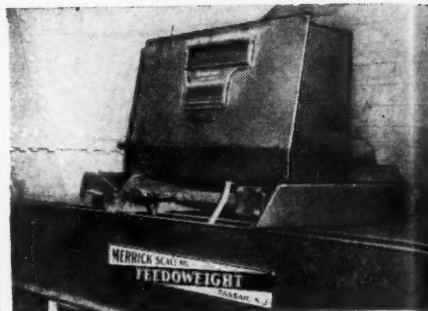
Kennametal Inc., Latrobe, Pa., has appointed John A. McMaster a special mining representative. He will devote his activities solely to the company's percussion bit.

Wickwire Spencer Steel Division, The Colorado Fuel & Iron Corp., has named H. C. Allington, formerly assistant general sales manager, general manager of sales of the division, with offices in New York City.

Robins Conveyor Division, Hewitt-Robins, Inc., Passaic, N. J., has appointed the St. Louis Railway Supply Co., St. Louis, Mo., as a distributor in the general St. Louis area.

Nagle Pumps, Chicago Heights, Ill., has named Charles L. Edwards chief engineer. Mr. Edwards was previously with the pump engineering department of the American Manganese Steel Division, American Brake Shoe Co.

The Timken Roller Bearing Co., Canton, Ohio, has transferred William E. Bryden, sales engineer, from the Chicago office to the Cincinnati office of its steel and tube division. He will



## THE MERRICK FEEDOWEIGHT

Reg. U. S. Pat. Off.

tells rate per hour  
—weight per day

A self-contained automatic conveyor scale, combined with automatic gate to give feed rate control. Powered feed regulator operates gate, without restraint on scale beam. Feed rate may be varied. Large feed opening insures even flow. Uniformly feeds bulk material BY WEIGHT; and automatically totalizes weight of materials fed. Durable. Simple to operate. Rugged, heavy duty design. Slow moving parts means long life. Easy to install and maintain.

*Manufacturers of*  
The Merrick WEIGHTOMETER, which weighs any material carried on a belt conveyor without interrupting conveying operation. Complete descriptive matter on request.

**MERRICK SCALE MFG. CO.**

Engineers and Mfrs. of Automatic  
Weighing Equipment  
PASSAIC, N. J., U. S. A.

## PRESSURE CONCRETE

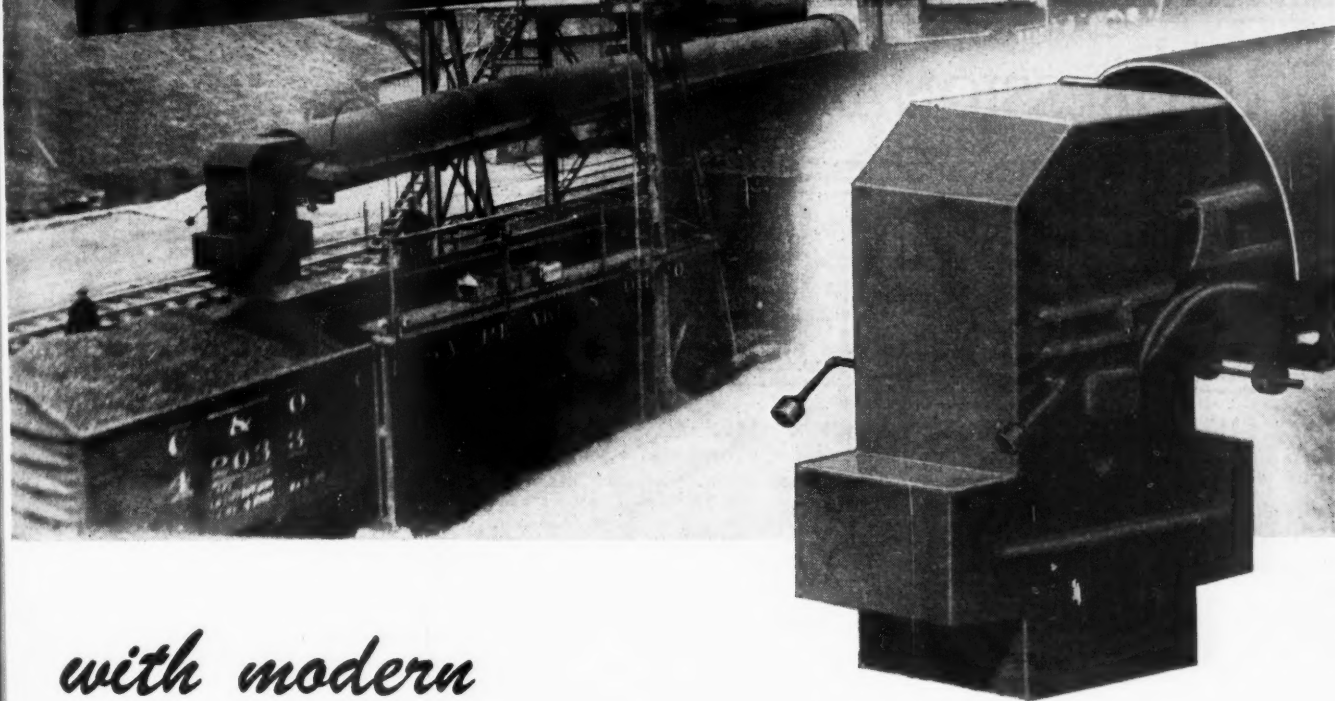
(GUNITE SYSTEM)  
by HUDSON RUMSEY CO., INC.

For  
Repairs & Construction of

- MINE TUNNELS
- BUILDINGS
- BRIDGES
- RESERVOIRS
- CANALS
- TANKS
- COAL BUNKERS
- WALLS
- DAMS

**HUDSON RUMSEY  
CO. INC.**  
1200 NIAGARA ST. BUFFALO, N. Y.

# EFFECTIVE, EFFICIENT DUST-PROOFING



## with modern OIL SPRAY INSTALLATIONS

TREATING with Permatreat Coal Spray is the simplest and most effective method of dustproofing and freeze-proofing coal at the mine. Modern equipment, such as the hood installation shown above, assures perfect control and proper concentration of oil without waste. Every grade of coal can be economically treated to keep down dust all the way from mine to consumer. Proper application will also freeze-proof shipments destined for areas where low temperatures prevail.

One of our representatives will gladly recommend the proper treating equipment for your mine and loading operations. Write for details on treating with Ashland Permatreat Coal Spray.



**ASHLAND OIL & REFINING COMPANY**  
Ashland, Kentucky



be succeeded at Chicago by William T. Strickland, sales engineer.

**Fawick Airflex Co., Inc.**, Cleveland, Ohio, has named Richard Scott Huxtable executive vice president and general manager. Prior to his new appointment, Mr. Huxtable was assistant to George W. Codrington, vice president and general manager of the Cleveland Diesel Engine Division, General Motors Corp.

**Davey Compressor Co.**, Kent, Ohio, has appointed J. S. Darkin Co., Harrisburg, Pa., as distributor of Davey

equipment in 18 Pennsylvania counties.

**Joseph T. Ryerson & Son, Inc.**, Chicago, has appointed Earl R. Nelson manager of its Cincinnati plant, succeeding Wayne D. Dukette, who will head the company's new steel-service plant in the San Francisco area, now under construction.

**Foote Bros. Gear & Machine Corp.**, has named R. B. Moir assistant vice president in charge of engineering and product development of its industrial gear division. B. H. Quackenbush,

formerly assistant sales manager, has become sales manager of the division.

**Pettibone Mulliken Corp.**, Chicago, has appointed W. E. Madden sales and division manager of the conveyor division of its wholly-owned subsidiary, the George Haiss Mfg. Co., New York City. Mr. Madden was division and sales manager of A. B. Farquhar & Co. from 1931 to 1947.

**B. F. Goodrich Co.**, Akron, Ohio, has appointed Carmen F. Newland, associated with the company for 20 years, manager of the Kansas City district of its industrial products sales division.

**Revecor**, Chicago, has announced that J. F. Kotchevar and J. H. Reichwein, for many years chief electrical engineer and general superintendent, respectively, of the Janette Mfg. Co., Chicago, have joined its organization.

**Rheem Mfg. Co.**, New York, has appointed R. Louis Towne sales promotion manager.

**Syntron Co.**, Homer City, Pa., has purchased the former H. K. Porter Co., shell plant at Blairsville, Pa., 12 miles from Homer City. With transfer of the manufacture of its large, heavy duty vibratory feeders and conveying equipment to this mill-type building, the company expects to add 100,000 sq. ft. of modern, up-to-date, heavy manufacturing facilities to its main plant at Homer City.

**The Timken Roller Bearing Co.**, Canton, Ohio, has purchased the eight-acre site and taken over all construction on a new \$150,000 rock-bit plant at Colorado Springs, Colo. A daily output of some 10,000 rock bits a day has been scheduled and about 75 persons will be employed at the start. Frank M. Givin, general foreman of the company's Mt. Vernon plant, has been named manager of the new unit.

**Caterpillar Tractor Co.** has announced that construction of a new factory providing 785,000 sq. ft. of space for the manufacture of diesel wheel-type tractors and diesel motor graders and for the final assembly of scrapers, wagons and rippers, has been begun at the company's Peoria, Ill., plant.

**The Linde Air Products Co.**, unit of Union Carbide and Carbon Corp., New York, has begun construction on an oxygen filling station and acetylene-producing plant at Creve Coeur, near Peoria, Ill.

**Johns-Manville Corp.**, New York, unveiled Oct. 16 the first big laboratory and pilot-plant building of the modern Research Center group it is erecting near Manville, N. J., and laid the cornerstone of the second building, now under construction. Located on a 93-acre tract about 40 miles from New York, the new J-M Research Center will ultimately be composed of five or six buildings with a total of 337,000 sq. ft. of floor space.

## PROFESSIONAL SERVICES

### ALLEN & GARCIA CO.

ENGINEERS AND BUILDERS OF  
MODERN COAL OPERATION

Authoritative Valuations, and Reports of  
Mining Properties Equipment and Operation.

322 S. Michigan Ave., Chicago  
120 Wall Street, New York, N. Y.

### HERBERT S. LITTLEWOOD

CONSULTING ENGINEER

Application — Supervision of Installation  
Maintenance — Inspection — Testing

POWER-HAULAGE-HOISTING-VENTILATION

1104 South Braddock Avenue, Pittsburgh 18, Pa.

### BURRILL and GWIN

Power Plant and Transmission Lines  
Mine Ventilation, Haulage and Drainage Systems  
Sewage Disposal and Water Supply  
Industrial Plants, Surveys, Reports  
Baltimore, Md. Altoona, Pa.

### W. P. MEIRING

Consulting Engineers

COAL MINING PROBLEMS RELATED  
TO FEDERAL TAXES

2958 Northampton St., N.W., Washington, D. C.  
Phone Woodley 5139 and Temple 5859

### F. CARL COLCORD

Consulting Engineer

COAL LAND VALUATIONS  
MINE INSTALLATIONS AND  
OPERATION

1132 Union Trust Bldg.  
Cincinnati, Ohio  
Phone Cherry 5403

Box 268  
Paris, Ky.  
Phone 648

### MINERAL PROSPECTORS INC.

MINERAL PROSPECTING—ASSAYS—  
GEOLOGICAL REPORTS  
DIAMOND CORE DRILLING  
Middlesboro, Kentucky

### EAVENSON & AUCHMUTY

Mining Engineers

COAL OPERATION CONSULTANTS  
VALUATION

2720 Koppers Bldg.

Pittsburgh 19, Pa.

### C. C. MORFIT & ASSOCIATES

Consulting Engineers

11 Broadway, New York 4, N. Y.  
Cable Address Mandmetal, New York

### HENRY O. ERB

Coal Preparation Consultant

PLANT DESIGN AND OPERATION

1018 So. 8th St. — Terre-Haute, Ind.

### TEMPLETON-MATTHEWS CORPORATION

Designing Engineers—Consultants—Builders

MODERN COAL PREPARATION PLANTS THROUGH  
"CO-OPERATIVE ENGINEERING"

906-06 Sycamore Bldg. Terre Haute, Indiana

### J. H. FLETCHER

30 Years

Continuous Consulting Service  
to Coal Mines

Telephone Harrison 5151

McCormick Building

Chicago, Illinois

### L. E. YOUNG

Consulting Engineer

MINE MECHANIZATION  
MINE MANAGEMENT

Oliver Building—Pittsburgh, Pa.

### LANCASTER, ALLWINE & ROMMEL

Registered Patent Attorneys

Patent and Trade-Mark Practice before U. S. Patent  
Office. Validity and Infringement Investigations and  
Opinions. Booklet and form "Evidence of Concep-  
tion" forwarded upon request.

Suite 416, 815—15th St., N.W., Washington 5, D. C.

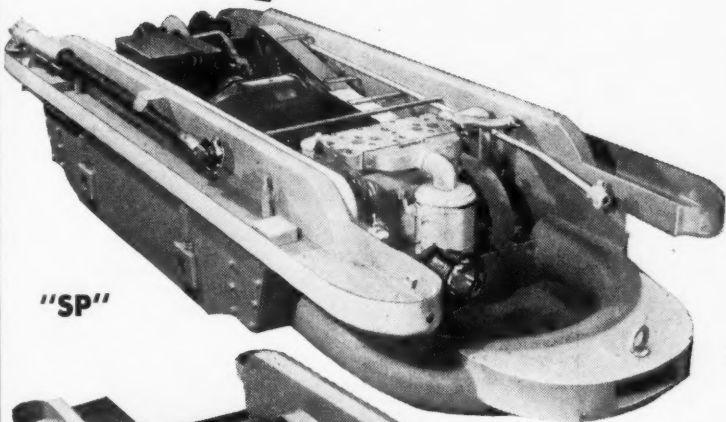
### Consult these Specialists

when you need professional assistance in solving difficult problems. Their specialized knowledge and broad experience can prove invaluable in saving both time and money for you.

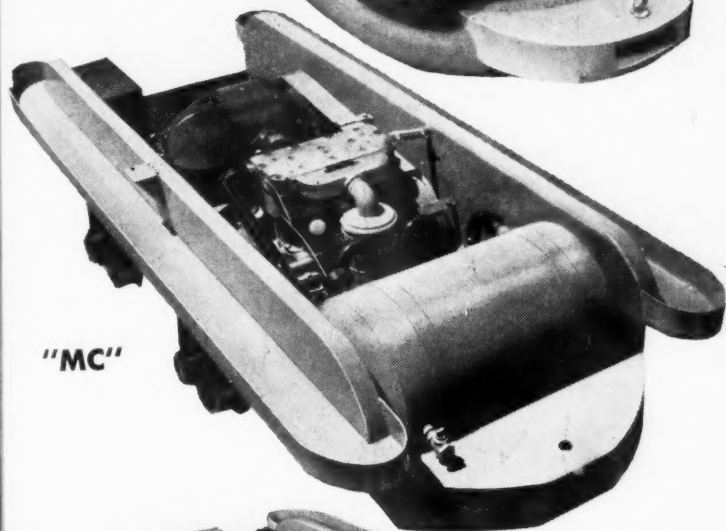
# THESE 4 GREAT AIR COMPRESSORS -

*meet every mining requirement*

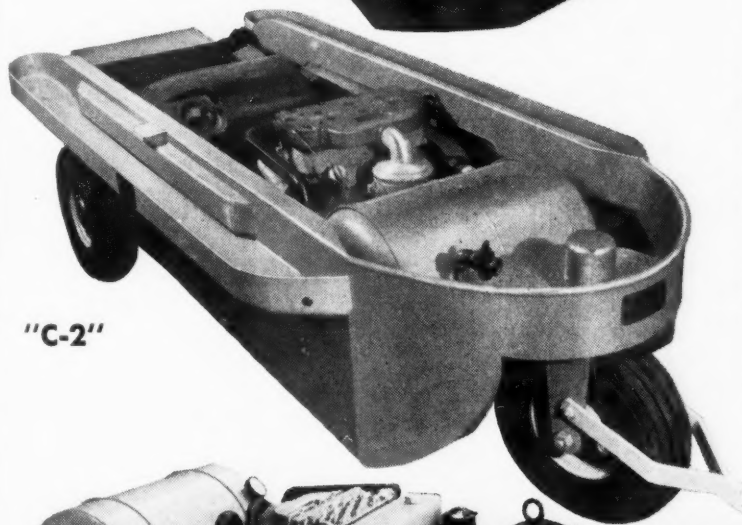
"SP"



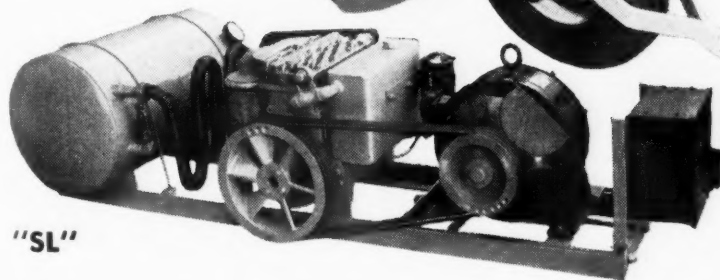
"MC"



"C-2"



"SL"



Behind every Cantrell Compressor are the years of engineering experience and craftsmanship that have made the name Cantrell synonymous with dependable, efficient compressor service. These four compressor models have proved their merit and hundreds of installations are giving complete satisfaction.

★ The Cantrell "SP" Self-Propelled Compressor is a two-ton locomotive and compressor combined, which, in addition to its regular duties, takes on jobs formerly requiring heavy locomotives and crews, such as ditch lining, leveling haulways, shifting mining machines, hauling repairs and many other jobs.

★ The Cantrell "MC" Mine Car Compressor embodies the finest features of compressor and mine car construction to deliver dependable, long-life compressor service under the toughest mine conditions. The "MC" is transported in regular trips of cars or by separate locomotives.

★ The Cantrell "C-2" is designed for trackless mining operations. It is equipped with heavy duty rubber tires, easy to handle, ready to go anywhere, in or out of the mine, for dependable service.

★ The Cantrell "SL" Compressor is a complete unit that offers emaximum efficiency whether it be used as a stationary compressor or mounted in a mine car for mobile operation.

If you need a compressor, you need a "Cantrell". There's one built to meet every mining requirement.

## IMPERIAL-CANTRELL Mfg. Co.

JELLICO

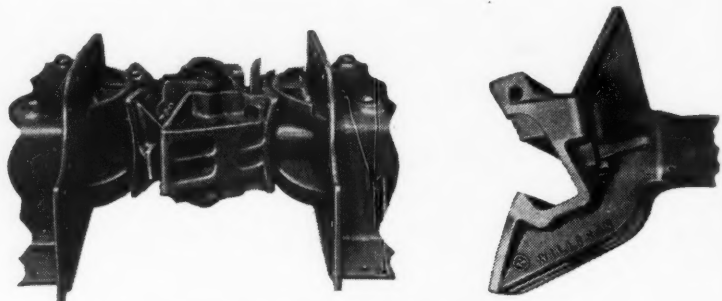
TENNESSEE

*Cantrell*  
COMPRESSORS

# 4 WAYS TO MOVE COAL FASTER ...AT LESS COST!

## 1 WILLISON AUTOMATIC COUPLERS

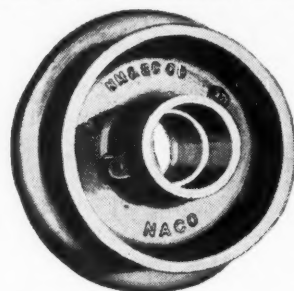
Faster, safer shunting, gathering, handling and dumping.



Made for 4-wheel or 8-wheel cars.  
No uncoupling on rotary dumps.

## 2 NACO STEEL CAR WHEELS

Lighter, stronger, practically eliminate flange breakage.



Available in any size with hubs for plain or roller bearings.

## 3 NACO STEEL SWIVEL HITCHINGS

Individually cast links, riveted together to form a complete hitching.



Furnished in a wide range of sizes to provide ultimate strength from 100,000 to 220,000 pounds.

## 4 Consult us about Mine Car Equipment

Our engineers will work with you or your car builders, without obligation.



Est.

1868

# NATIONAL

MALLEABLE and STEEL CASTINGS CO.  
*Cleveland, Ohio*

SALES OFFICES: Cleveland, Chicago, New York, Philadelphia, Richmond, San Francisco, St. Louis  
WORKS: Cleveland, Chicago, Indianapolis, Melrose Park, Ill., Sharon, Pa.

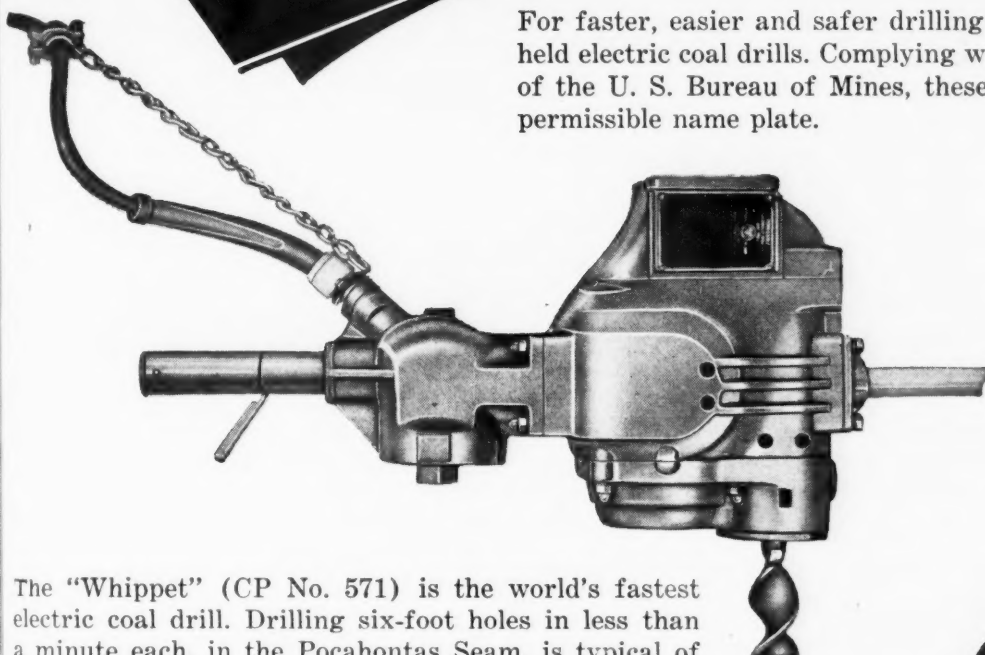


**For Faster Drilling...**



## CP Electric Coal Drills

For faster, easier and safer drilling use CP permissible hand-held electric coal drills. Complying with all safety requirements of the U. S. Bureau of Mines, these drills carry the Bureau's permissible name plate.



The "Whippet" (CP No. 571) is the world's fastest electric coal drill. Drilling six-foot holes in less than a minute each, in the Pocahontas Seam, is typical of its performance.



More powerful and ruggedly built than the "Whippet," the CP No. 572 Electric Coal Drill is recommended for tough drilling in coal, slate, shale, and other hard formations. In the difficult drilling Alma Seam, drilling time ranges from 1 minute, 10 seconds to 1 minute, 30 seconds per seven-foot hole.



**CHICAGO PNEUMATIC  
TOOL COMPANY**

General Offices: 8 East 44th Street, New York 17, N. Y.

ELECTRIC TOOLS • AIR COMPRESSORS • PNEUMATIC TOOLS • DIESEL ENGINES  
ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

# What About the Coal Industry's Public Relations?

Here is what the National Coal Association, through  
its public relations department, BITUMINOUS COAL INSTITUTE, is doing

## ADVERTISING

Three different campaigns are telling the story of coal and the coal industry to editors and publishers; to teachers; and to opinion leaders among the general public. Each of these important groups is regularly receiving its own separate messages in the professional, business, or general publications edited and published especially for that group.

## RADIO BROADCASTS

Our new program, "Congress Today," presents unbiased, unslanted "spot news" from the Capitol, with nationally famed Albert L. Warner as reporter and commentator. Each day's broadcast includes a brief news item pertaining to the coal industry. The program is planned to be of particular interest to members of Congress, Government officials, Washington newsmen and others to whom what happens in Congress is of deep interest.

## PRESS INFORMATION SERVICES

Publicity releases go to leading newspapers and radio outlets across the country . . . close contacts are maintained with editors and writers to assure that they receive factual information about the coal industry in all its aspects . . . and to make certain that the facts are correctly interpreted.

## EDUCATIONAL DEPARTMENT

Under the direction of an eminent educator, school text and reference books are checked and rechecked for the accuracy of their information pertaining to the coal industry. Close personal cooperation is given to schoolbook writers, editors, and publishers to supply them with the most up-to-date coal data. Informative literature is published for and distributed to teachers . . . instructive exhibits dramatize coal's story at gatherings of teachers and other educators.

## MOTION PICTURES

Professionally produced film presentations dramatically portray the most modern mining and coal handling methods; the way miners work and live; the importance of coal as a basic commodity and the many ways the industry serves the public. These films are made easily available to all interested clubs and organizations, and have been receiving wide circulation.

## SPEAKERS' BUREAU

A well-organized pool of volunteer speakers has been recruited from among coal company executives. These speakers are provided with carefully prepared material on a variety of subjects relating to the industry and are always on call to appear before civic, social and other groups.

The purpose of this extensive public relations program is, of course, to create a more sympathetic public understanding of the coal industry than now exists . . . to win public appreciation of the skilled management and progressive attitude of the operators . . . to gain recognition for the great public service this huge basic industry is performing under private ownership and management . . . and to assure the industry a useful and prosperous future.

With such a penetrating program, it is certain that substantial progress is being made toward realizing these objectives, which are in the individual interest of everybody concerned with producing, shipping or selling bituminous coal.

Now going into its fifth year of increasingly effective operation, the Bituminous Coal Institute—now a department of the National Coal Association—merits the support of everyone in the industry.

## Bituminous Coal Institute

A Department of

## NATIONAL COAL ASSOCIATION

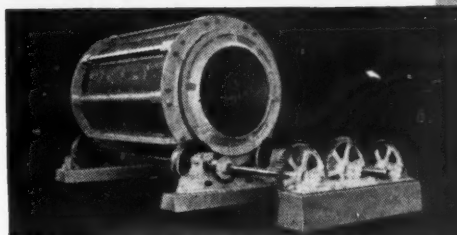
Washington, D. C.

BITUMINOUS COAL . . . LIGHTS THE WAY . . . FUELS THE FIRES . . . POWERS THE PROGRESS OF AMERICA

# CONDITION YOUR R.O.M. FOR WASHING

Latest Roller Mounted  
"Pennsylvania" Bradford  
Breaker... Installed 1947

Original "Pennsylvania"  
Bradford Roller Mounted  
Breaker ... 1918



- Crush and Screen in a Single Operation
- At Lowest Possible Maintenance and Power Costs
- With Maximum Coarse Sizes and Few Fines

The "Pennsylvania" Bradford Breaker reduces conditioning costs at the mine. It makes full seam mining practical and economical—removes mine debris—protects the washer. It trims good coal from binder and automatically discards the hard rock, the tramp iron and mine timbers, the sulphur balls and other refuse—everything except that which will go through the screen—and in most cases it eliminates hand picking and scalping.

The "Pennsylvania" Bradford, like other "Pennsylvania" equipment, is of massive "Steelbuilt" construction, with oversize parts at wearing points and many exclusive features of design—a crusher engineered for its specific purpose as a result of years of experience, built in capacities from 50 to 1500 tons per hour, and unequalled by other types of equipment in low maintenance cost.

We invite inquiries, will be happy to consult with you, help determine your requirements, make recommendations—and show how a "Pennsylvania" Bradford can save real money for you.

**PENNSYLVANIA CRUSHER COMPANY**  
**Liberty Trust Bldg. Philadelphia 7, Pa.**

New York • Pittsburgh • Chicago • Los Angeles

Associated with Fraser & Chalmers Engineering Works, London

**"PENNSYLVANIA" STEELBUILT**



# PACK AWAY COSTLY LEAKS ... SEAL 'EM TIGHT WITH QUAKER PACKINGS



With operating costs rising constantly, it's profitable to stop costly leaks and drips throughout your mine. And for tight sealing, economical service, it pays to pack pumps, valves, flanges, piston rods with Quaker quality packings . . . specially designed for each application.

These three packing leaders are but a few of the many types of Quaker packings for all uses and pressures. Remember, if it's packing for all purposes . . . conveyor, transmission or elevator belting . . . air, steam, or water hose, call your Quaker Distributor for quick, reliable service.

**FOR PUMPS**—Quaker offers a complete line of packings for centrifugal and reciprocating type pumps . . . for water and other liquids. Long-lasting, leak-proof, economical.

**FOR FLANGES**—Quaker Ebonite Sheet Packing holds in high pressure, will not harden or melt, expands evenly. Ideal for superheated steam.

**FOR VALVES**—Quaker Valvolite, carefully twisted and lubricated, seals tightly. Stays pliable, won't score stems.

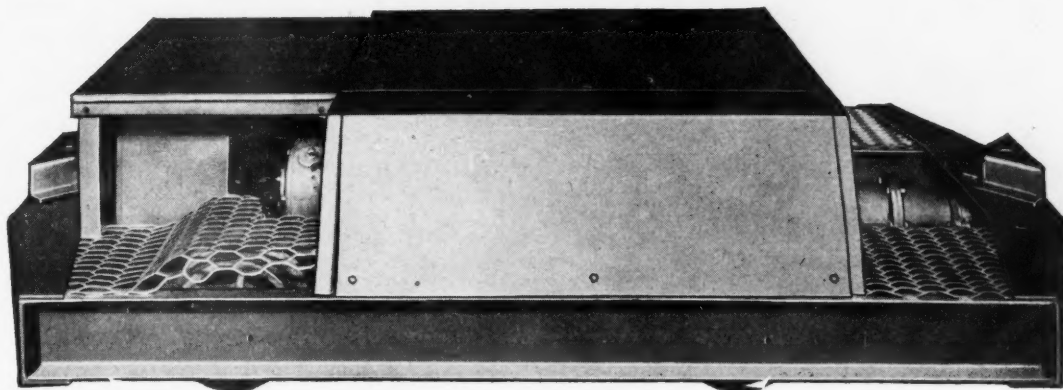


## QUAKER RUBBER CORPORATION

PHILADELPHIA 24, PA. • NEW YORK 7 • CLEVELAND 15 • CHICAGO 16 • HOUSTON 1  
Western Territory  
QUAKER PACIFIC RUBBER COMPANY • SAN FRANCISCO 5 • LOS ANGELES 2

# Rock Dusting...*better than INSURANCE*

• Rock Dusting with DUSTRIBUTORS safeguards lives and property •



## The Dustmaster... trouble free-performance

A high pressure machine that can be used on entries and in remote areas to a distance of 500 feet. Compactly and rigidly built for hard service.

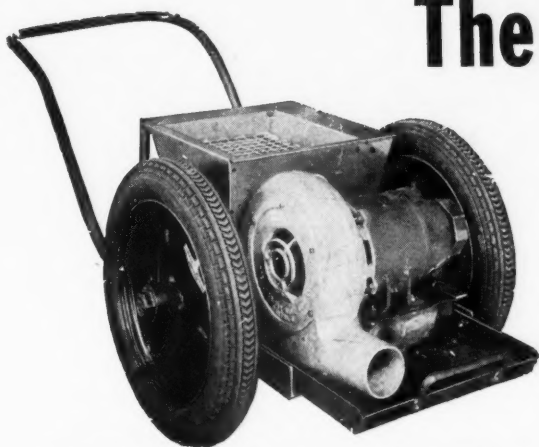
Safety devices on all essential units to protect the equipment and operators.

Greatest distributing capacity. Built as low as 25 inches above rail. 250 lbs. of dust per minute through short hose. 125 lbs. per minute through 500 feet of hose.

Write for particulars.

## The Mighty Midget . . .

**A portable machine that does  
A WHALE OF A JOB!**



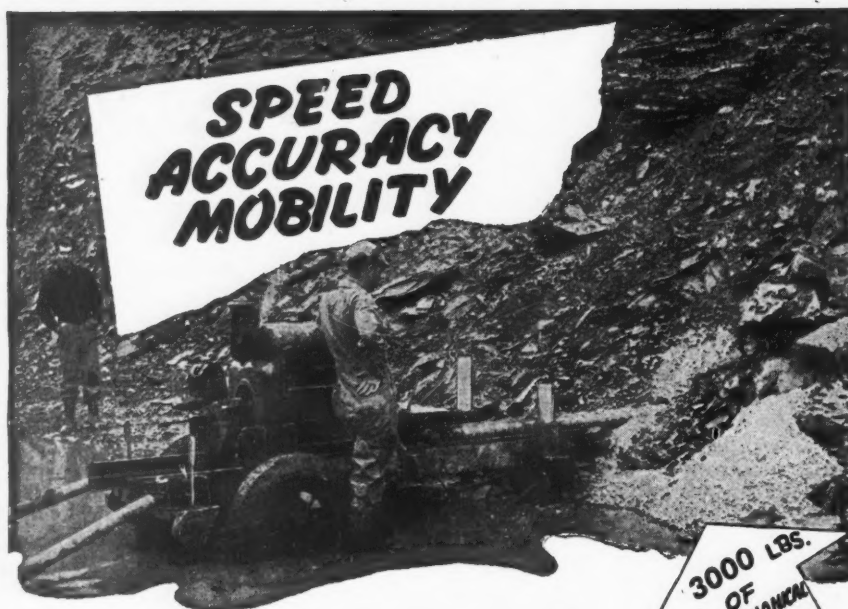
*We will demonstrate it at your mine without obligation. SAY WHEN.*

Equipped with a short hose nozzle and sufficient trailing cable it can be transported to rooms to dust faces or into remote sections, back areas and air courses. In actual performance it has distributed MORE THAN A TON OF DUST PER HOUR during an entire shift including lost time. It can be dragged on its bottom, transported on belt, in coal car, shuttle car, on low truck (we build), cart (like illustrated) or on the cutter bar of a mining machine.

**ONE SHOULD BE IN EVERY MINE WITH OTHER EMERGENCY EQUIPMENT**

*Send for descriptive catalog of Safety Devices.*

**THE AMERICAN MINE DOOR COMPANY, 2057 DUEBER AVE., CANTON, OHIO**



# Parmanco

## MECHANICAL FEED HORIZONTAL DRILL. WITH TRACTION DRIVE

3000 LBS.  
OF  
MECHANICAL  
DYNAMITE

Ten years of field test has proven that our power-feed design of direct transmission and worm gearing with two-speed control will not only cut shot hole drilling time in half but also eliminates costly maintenance delays. V-belt drive to the power-feed with an additional ample clutch in that assembly gives absolute control of a drilling speed of two to three feet per minute with a retrieving speed of twenty-four feet per minute.

The Parmanco Horizontal is adapted to all forms of high-wall drilling, will handle a six-inch auger up to a distance of sixty feet or more and, by use of our patented augers with interrupted flights and secondary cutters, will drill an absolutely clean hole with a minimum of torque. It permits the drilling of a controlled-angle hole which makes possible a great saving of explosives through the cantilever effect of this controlled-angle drilled hole.

**EFFICIENT STRIPPING STARTS WITH  
EFFICIENT DRILLING**

PARIS MANUFACTURING COMPANY  
PARIS, ILLINOIS

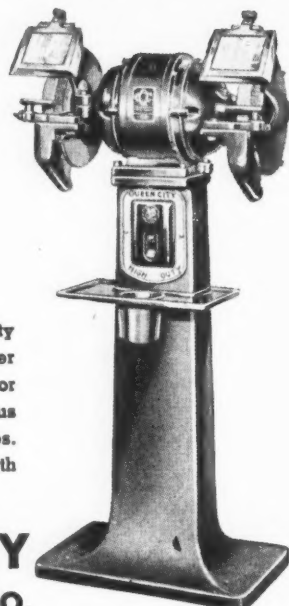
## KEEP TOOLS SHARP with QUEEN CITY Low-Cost GRINDERS

It takes a top-quality grinder to stand up under the heavy work that pours through a mine maintenance shop. Queen City Grinders are noted for their durability, freedom from downtime, and dependable performance.

Illustrated is a Heavy Duty Queen City Floor Grinder equally adaptable to fine or heavy work. Has numerous safety and operating features. Send for catalog complete with prices and details.

**QUEEN CITY  
MACHINE TOOL CO.**

215 E. 2nd St.  
Cincinnati 2, Ohio



Agents in  
Principal cities

## WELD WITH TWECO



"Sol-Con" Cable Connectors provide a quick detach or "jump-in" of welding cables. Efficient for shop or field use. No. 1 size for small cables; No. 2 size for medium and large cables. Simple operation, easily installed, low cost.



"Sol-Con" Machine Terminals permit quick cable removal right at the welder. Fine for reversing polarity. Turn and toggle connects or disconnects. Made of angle or offset types.

"TWECOTONG" Insulated Holders come in 250, 300 and 500 ampere sizes. Glass Cloth Bakelite Insulation. Neoprene Spring covering. Cool running, positive grip, perfect balance.



Redhead Ground Clamps come in Midget 125 amp., Jr. 300 amp. and Sr. 500 amp. models made of high copper alloy. Features insulated spring, clamp cable connector. Provides a portable, rugged, efficient, low cost ground.

Free TWECOLOG gives full price and parts information on all TWECO Electrode Holders, Calmps, Splicers, Connectors, Terminals and Lugs.

MANUFACTURED BY

**TWECO PRODUCTS CO.** 1030 E. English  
Wichita 1, Kans.  
Export: Henry R. Jahn & Son, 7 Water St., New York, N. Y.  
In Canada: G. D. Peters & Co. of Canada, Ltd., Montreal-Toronto

"CONNECT WITH TWECO"



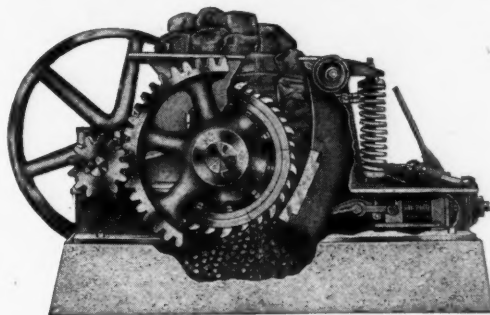


# McLANAHAN BLACK DIAMOND CRUSHER

•With Automatic Steelstrut Toggle and Quick Adjustment

DEPENDABLE

FAST



ECONOMICAL

POWERFUL

Built for "peak" production under difficult working conditions—McLanahan Black Diamond Crushers are doing an outstanding performance job for hundreds of important

coal producers. For present needs or future modernization of your workings—call on McLanahan. Built in all capacities for any sized product required. Descriptive data on request.

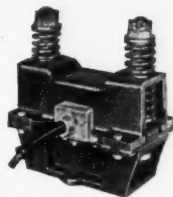
## McLANAHAN AND STONE CORPORATION

Pit, Mine and Quarry Equipment Headquarters Since 1835

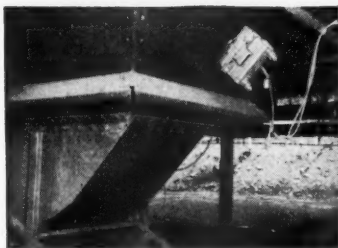
HOLLIDAYSBURG, PENNA.

### SYNTRON

"Pulsating Magnet"



## ELECTRIC VIBRATORS



**Keep Coal Bins, Hoppers and Chutes Open and Free-Flowing**

Break down arching and plugging  
Eliminate pounding, poking and sledging

Available in 8 different sizes, from a little 4 lb. model up to a big 660 lb. model—they can be applied to most any type of bin, hopper or chute.

Write for illustrated folder

SYNTRON CO., 975 Lexington, Homer City, Pa.

## Sand Drying Stoves

The SUTTON No. 0 IMPROVED SAND DRYER includes all the time-tested principles that have made SUTTON STANDARD Sand Dryers a favorite for over forty years, plus many improvements to give you even better results. Write for catalogs, prices.

- PERFORATED RING — Entirely new design.
- A FIRE BOWL added between the grate and perforated ring. New type FIRE GRATE.
- ASH PIT DOOR EXTENSION to protect clean sand from ashes.
- 3/16" STEEL PERFORATED SKIRTING with clean-out doors.
- ECONOMY FLAME SPREADER in dome.



# SUTTON

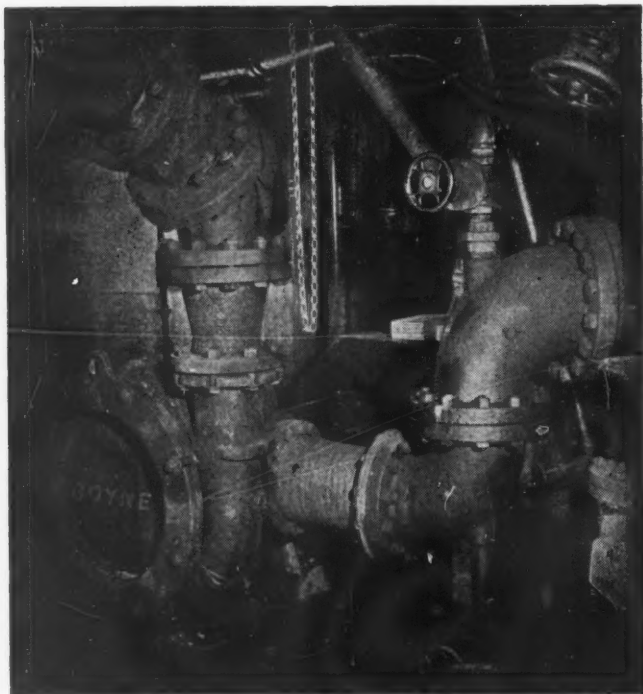
Made by

INDIANA FOUNDRY CO.

950 Oak Street

Indiana, Pa.

# GOYNE PROCESS PUMPS



A Sand Pump is only a link in a chain in a coal washing plant, but it can be a strong link if it embodies the following features as does the Goyme.

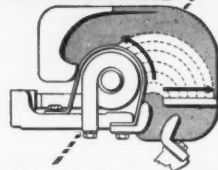
1. Ease of inspection of all wearing parts. All internal portions are immediately accessible after removing only the rear head of the pump. No suction or discharge piping is disturbed.
2. The one packing box of the pump subjected only to suction pressure and is readily kept clean by a low pressure clear water line. Long packing and shaft sleeve life is assured.
3. Impeller clearance is adjusted *while the pump is running*, insuring constant pump capacity so essential for uniform washing.
4. There are twenty-eight possible nozzle assembly combinations for each standard pump. Washery designers like this "adaptability feature" as it helps them out of tight places and simplifies piping.
5. We carry the spare parts stock. Order your replacements when needed. Reduce your inventory by using Goyme Process Pumps.

*All inquiries receive prompt and careful attention.*

**THE GOYNE STEAM PUMP CO.**  
ASHLAND, PA.

## LOAD FACTOR

*Improved*



LINE-ARC design removes the arc from tips in 1/500 sec., centers it between the arc shields. Assures consistent opening of the power circuit.



### BY EC&M **LINE-ARC** SECTIONALIZERS

A STUB-END feeder, serving 3 locomotives each equipped with two 52 HP motors, has its LINE-ARC Sectionalizer adjusted to trip out when all 3 locomotives start up at one time.

Localizing interruptions with these low-cost protective units reduces main circuit-breaker outages and minimizes the risk of fire.

Automatic reclosure takes place when the line is clear. And only a small current is required by the load-measuring (feeler) circuit, because the closing-relay operates electronically.

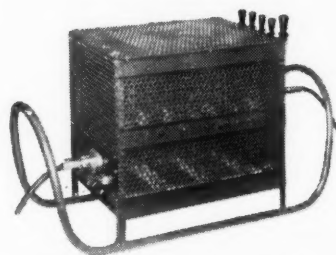


Write for Bulletin 1400

**THE ELECTRIC CONTROLLER & MFG. CO.**  
2698 East 79th Street Cleveland 4, Ohio

## Better, Faster Welding in the Mine or the Shop

*by doing your bond and  
welded repairs, with*



### Flood City Welding Machines

250 and 500 Volts, D. C.

Specially designed switches give exceedingly fine adjustment of the welding current. Simple adaptors fit the machines to larger than normal voltage changes. Ideal portability is provided by the new skid-type base.

*Send for descriptive literature.*

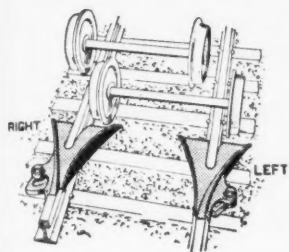
**Flood City Brass & Electric Co.**

Messenger & Elder Sts., Johnstown, Pa.

Branch Office: 4 Virginia St. W.; Charleston, W. Va.

# World's Quickest Way to Rerail Cars and Locomotives

**"Anchor" Rerailers Get 'Em Back on the Tracks, Saving Time, Labor, Money**



• This is the quick, efficient way to get derailed cars and locomotives back into productive service. No other rerailer has the patented, scientifically-designed features of the "Anchor" Rerailer.

Smashed hands, strained backs and often fatal accidents are eliminated when "Anchor" Rerailers are used. Safety Inspectors and Engineers highly recommend their use. Made of special high carbon steel for durability and long life.

**How Anchor Rerailers Work.** "Anchor" rerailers are used in pairs, and will retrack wheels from either or both sides of rail at same time. Each Rerailer straddles the rail, and the narrow end on top of the rail. The derailed wheel comes up the gradual slope, and is forced back on to the rail by the guiding grooves and ridges. Can be used anywhere on the track. The "Anchor" Rerailer is the only one that has a self-contained lock.

Size of Rerailer	For Use on Rails as Follows:	Locomotive or Car Capacity	Price Per Pair
No. 2	16 lbs. to 40 lbs.	10 tons	32.50
No. 3	30 lbs. to 60 lbs.	15 tons	37.50
No. 4	50 lbs. to 75 lbs.	40 tons	52.50
No. 5	70 lbs. to 100 lbs.	100 tons	80.00
No. 6	100 lbs. to 152 lbs.	200 tons	157.50

F. O. B. Bowerston, Ohio  
Send Order Now! Immediate Delivery. Complete Satisfaction Guaranteed!  
Free Descriptive Literature If Desired!

**THE NOLAN COMPANY, Dept. CA, Bowerston, Ohio**  
Formerly The Mining Safety Device Co.

THE MOST famous  
NAME IN POWER

# HOISTS

ALL TYPES — ALL SIZES  
ALL ADVANTAGES

## American Hoist

and DERRICK COMPANY  
St. Paul 1, Minnesota

745

Plant No. 2, So. Kearny, New Jersey

Offices: Chicago • Pittsburg • New York • New Orleans • San Francisco

# I DOUBLED my truck's earning power



with a

DETROIT AUTOMOTIVE

## Thornton Drive

"Yes, sir! I really hit a gold mine when I put Thornton 4-Rear Wheel Drive on my medium truck! That Thornton Drive has made my medium truck into a heavy hauler—a powerful, high capacity, rugged 6-wheeler. It has doubled my profits by doubling my payloads and increasing my performance by nearly 100%—yet I still have the operating economy and advantages of a medium truck!

"Figure it out yourself. My medium truck had a G. V. W. of 14,000 pounds. When equipped with a Thornton Drive, that same truck has a gross of 30,000 pounds. This additional equipment increased my body and chassis weight by only 78%. Therefore, the payload was more than doubled.

"And performance? My Thornton Drive, using 3 NoSPIN Differentials\*, gives me *two* driving axles, *four* driving wheels—each with powerful, positive, independent drive. With that increased traction plus the Thornton Drive's rugged walking beam springs, I can get out of mighty tough places—do jobs I'd never attempt otherwise. My performance is 100% better both on the road and on those rugged off-the-road jobs.

"Yes, sir—any trucker can hit the profit jackpot—*double his earning power*—by converting his medium equipment to heavy capacity, high performance trucks with Thornton 4-Wheel Drive!"



DETROIT AUTOMOTIVE

**\*NoSPIN Differential  
Is a Profit Saver!**

NoSPIN is standard equipment in the 2-speed gear case of the Thornton Drive, providing positive drive to both rear axles and eliminating axle fight over any terrain.

When NoSPINs are also used in both driving axles (optional), positive drive is provided to all four rear wheels.

NoSPIN Differentials are also available for single axle trucks.

# DETROIT AUTOMOTIVE

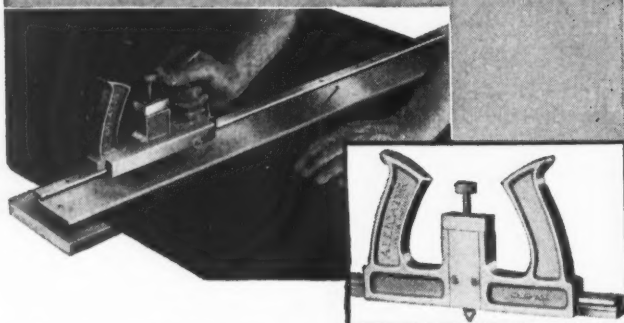
PRODUCTS CORPORATION

(Formerly Thornton Tandem Co.)

8701 Grinnell Ave. • Detroit 13, Michigan  
Distributed in U. S. A. by TRUCKSTELL DISTRIBUTORS



## MAKES CUTTING OF WIDE BELTS *Easy*



Here is a tool that makes the cutting of wide conveyor and transmission belting a simple and easy job—it's the Alligator Wide Belt Cutter for cutting all belts (except those containing metal) up to 60" wide and 1 1/8" thick.

The guide rail is clamped or nailed to the belt and the cutter head is pushed across the belt. Each cut is made about 1/8" deep and with several rapid strokes the belt is cleanly and squarely cut.

Bulletin No. BC-350 gives all the details on this new cutter.

Order from your Supply House

### FLEXIBLE STEEL LACING COMPANY

4638 Lexington Street, Chicago 44, Ill.

Also sole manufacturers of Alligator Steel Belt Lacing for transmission and conveyor belts, Alligator V-Belt Fasteners and Flex V Fasteners, for V-Belts, Flexco HD Fasteners and Rip Plates and Hinged Flexco Fasteners for conveyor belts.

## The Cincinnati

TRADE MARK



Write today  
for FREE  
illustrated  
bulletin

### ONE-MAN COAL DRILL

lowers drilling costs because it is designed and constructed to give more power "pound for pound" and more drilling efficiency "day after day". Used successfully in drilling both anthracite and bituminous coal. Easy to operate. Sold with money-back guarantee. Write today.

**THE CINCINNATI ELECTRICAL TOOL CO.**  
Division of The R. K. LeBlond Machine Tool Co.  
2635 MADISON ROAD - CINCINNATI 8, OHIO

## Cut Your Costs WIPING CLOTHS

Offered at a saving. Our specially made mixed color wiping cloth. Perfect for every day hard use in mines, construction work, etc. The perfect wiping cloth for oil, grease work, etc. A tried and proven cloth offered at these low prices—packed in 100 lb. bales.

1000 lbs. orders — 12c lb.

2000 lbs. orders — 11 1/2c lb.

Prices FOB, K. C.

Why pay more? Order today.

### AMERICAN SUPPLY CO.

317 W. 5th St.

Kansas City, Mo.

Manufacturers of Hi-Grade Wiping Cloths

## FLORY HOISTS



Manufacturers of Steam, Electric and Gasoline Hoists of all types; also parts for all model Flory Hoists.

**FLORY MANUFACTURING COMPANY,**  
**BANGOR, PENNSYLVANIA**

### PERFORATED METAL COAL MINING SCREENS

Manufactured exactly to your specifications. Any size or style screen, in thickness of steel wanted with any size perforation desired.

We can promptly duplicate your present screens at lowest prices.

### CHICAGO PERFORATING CO.

2443 West 24th Place  
CHICAGO, ILLINOIS  
Canal 1450

## CORE DRILLING —anywhere!

"We look  
into the  
Earth"

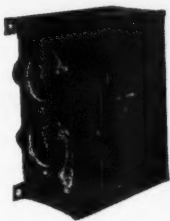


**PENNSYLVANIA**  
**Drilling Co.**  
DRILLING CONTRACTORS

1205 Chartiers Ave.

PITTSBURGH, PA.

WAlnut 5816



## NUSSCO AUTOMATIC MINE SIGNALS

For Main Haulage • Prevent Collisions  
Save Trip Time

A two wire cable connects two or more signals together into one block. Only one signal can show proceed on the entrance of a trip, all other signals show stop.

Low in cost • Easy to install • Write for Catalog

**NACHOD & UNITED STATES SIGNAL CO.**

INCORPORATED

4771 Louisville Ave., Louisville, Ky.

## CESCO ELECTRICALLY OPERATED TRACK SWITCH

Thrown by Motorman

Operates Switch Safely • Saves Time and Money

This modern track switch is thrown swiftly and safely by motormen as they sit in their cabs. It saves time and money, and is fool-proof and dependable!

Over 40 years experience manufacturing

**ELECTRIC TRACK SWITCHES**

Write for Catalog

**CHEATHAM ELECTRIC SWITCHING DEVICE CO.**

INCORPORATED

4780 Crittenden Drive, Louisville, Ky.

## SEARCHLIGHT SECTION

REPLIES (Box No.): Address to office nearest you  
NEW YORK: 330 W. 42nd St. (18)  
CHICAGO: 520 N. Michigan Ave. (11)  
SAN FRANCISCO: 68 Post St. (4)

### POSITION VACANT

WANTED: EXPERIENCED Mining Engineer for group of mines in Pittsburgh seam in Northern West Virginia. Must be familiar with Goodman and Jeffrey mining equipment, construction, layouts, ventilation, haulage and drainage. Salary commensurate with ability. Excellent opportunity for qualified man. F-3208, Coal Age.

### BUSINESS OPPORTUNITIES

#### Coal Strip Mine Ohio No. 7.

Over 200 ton daily; gross \$150,000 year; 800 acres under lease; modern newly equipped large tippie; loading-dragging shovels, caterpillars, tractors, bulldozers; large back log, ext. clientele; price \$90,000. Apple Co., Brokers, Cleveland, Ohio.

Suitable for one, or two slope mines with centralized washing plant. It is Ill. 6 vein, seven feet thick, laying under lime stone rack and black slate. There is a very large acreage available. Passed by the railroads and three state highways. For information or appointment write Fred A. Bigby, 107 E. Parker St., Pinckneyville, Ill.

#### For sale, Truck mine,

Central Illinois, Electric Hoist. Two cutting machines. Equipped for all grades of coal, all contracts we now have in writing goes with sale. Priced right for quick sale. For particulars write BO-3086, Coal Age.

## COAL LANDS

Suitable for strip mining. Complete details upon request.

**G. B. LORRAINE**

Law Building, Richmond 19, Va.

### STRIP COAL LAND

#### FOR LEASE

337 acres, 14 miles from Youngstown, Niles and Warren, Ohio. Very level, partly drilled.

Owners:—C. M. & Donald Kirk,  
Axis, Alabama

### Excellent Coal Stripping Proposition

36" to 48" coal at Depth, crop line, good coal at 12 ft. to 15 ft. up to as deep as want to strip. Get further information, write or call

**L. H. KING**

Clarksville

Arkansas

IF there is anything you want  
that other readers can supply—  
OR . . . something you don't want—  
that other readers can use—  
Advertise it in the

**SEARCHLIGHT SECTION**

### FOR SALE

Operating Central Illinois Truck

Mine—300 ton daily on solid—

Production can be doubled if mechanized—Ready market at high realization—Owner to retire—Price

Reasonable.

**Box 3195 Coal Age**

**520 North Michigan Ave.**

**Chicago 11, Ill.**

### FOR SALE LOADERS

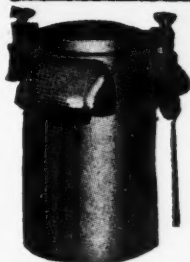
2 Myers-Whaley No. 4 Type Shovel Machines, one machine completely overhauled September, 1947, second machine Fair Condition. For price or inspection arrangements write or call—

**HANLEY COMPANY**  
Summerville, Pennsylvania

**FOR SALE: BRAND NEW** and slightly used wire rope: 2 3/4", 2 1/2", 2 1/4", 2", 1 3/4", 1 1/2", 1 1/4", 1 1/2", 1", 3/4", 3/8" and 9/16"; BRIGHT and galvanized; WIRE and hemp centers; 6 x 7, 19 and 37 construction; (for all purposes) different grades and lengths; CHEAP; inspection before shipment or on arrival at DESTINATION; above located in EAST and MIDDLE West. WANTED: used conveyor belts; Mine and incline HOISTS, steel sheet Piling.  
F.S. 2157, Coal Age, 520 N. Mich. Ave., Chi. 11, Ill.

## WANTED

## —TRANSFORMERS—



### TRANSFORMERS WANTED

in operating condition or burnt out. Mail us list giving complete nameplate data and stating condition.

We Rewind, Repair and Redesign All Makes and Sizes  
ALL TRANSFORMERS GUARANTEED FOR ONE YEAR

**THE ELECTRIC SERVICE CO., INC.**

"AMERICA'S USED TRANSFORMER CLEARING HOUSE"  
Station M Since 1912 CINCINNATI 27, OHIO

### WANTED

Two (2) Northwest 80-D Shovels, new or surplus.

**SUNNYHILL COAL CO.**

Telephone Lehigh 1001

3090 W. Liberty Ave. Pittsburgh, Pa.

### WANTED AIR COMPRESSOR

1—2,500 FT. OR 2 SMALLER CAP.

**DARIEN CORP.**

DARIEN

CONN.

### WANTED

One Joy 8-BU Loader

**DIXPORT COAL COMPANY**

Charleston 30, West Virginia

### WANTED

3/4 to 5 yard Shovels

2 to 10 yard Draglines

Tractors and Dozers

**Frank Swabb Equipment Co., Inc.**

Hasleton National Bank Building

Hasleton, Pa.

Telephones 4911 and 4910J

### WANTED

#### DUMP CARS

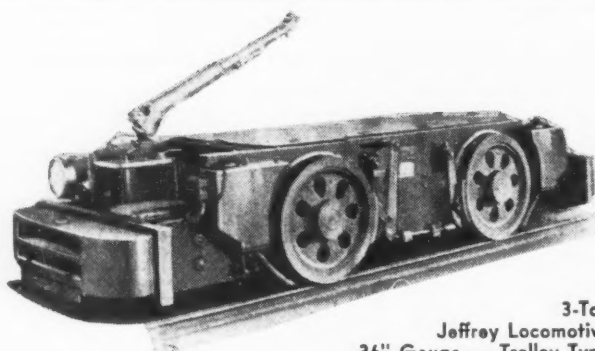
THIRTY-SIX INCH GAUGE BOTTOM DUMP CARS, FIFTEEN, TWENTY OR TWENTY-FIVE YARD CAPACITY.

**W. 2703 Coal Age**

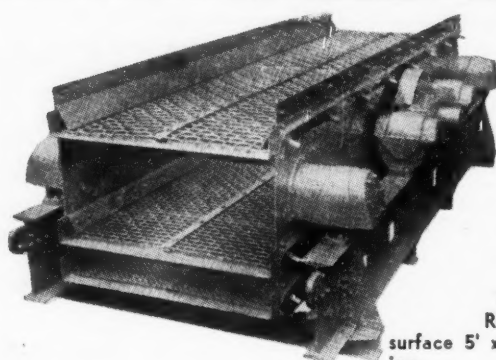
520 N. Michigan Ave., Chicago 11, Ill.

# COMPLETE LIQUIDATION IMMEDIATE DELIVERY

*... Three and one-half million  
dollars in new and nearly  
new coal mining machinery  
and equipment*



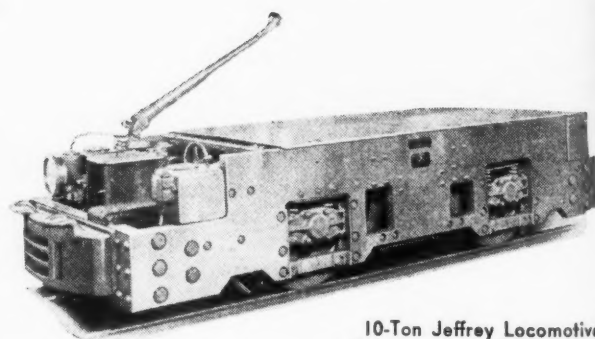
3-Ton  
Jeffrey Locomotive  
36" Gauge — Trolley Type



Type F-600 Ty-  
Rock Screen 2-  
surface 5' x 10' Full Float-  
ing.



6-Ton Jeffrey Locomotive 36" Gauge — Trolley Type



10-Ton Jeffrey Locomotive  
36" Gauge — Trolley Type



20-Ton Goodman Locomotive High Type — 36" Gauge



8-Ton General Electric  
Locomotive — 36" Gauge

## THE COLUMBINE MINE EQUIPMENT CO., INC.

FLAT IRON BUILDING, 1669 BROADWAY

DENVER 2, COLORADO

*Subsidiary of Portland Equipment Co., 11 Broadway, New York 4, N. Y.*

WRITE FOR OUR COMPLETE LIST OF MACHINERY AND EQUIPMENT

SEE PAGE 201 FOR APPROXIMATE SUMMARY OF HARD-TO-GET OFFERINGS



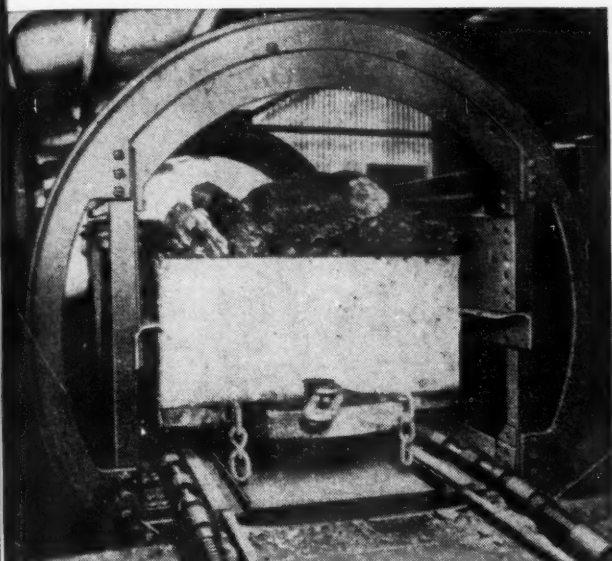
# THE COLUMBINE MINE EQUIPMENT CO., INC.

669 BROADWAY, DENVER 2, COLORADO

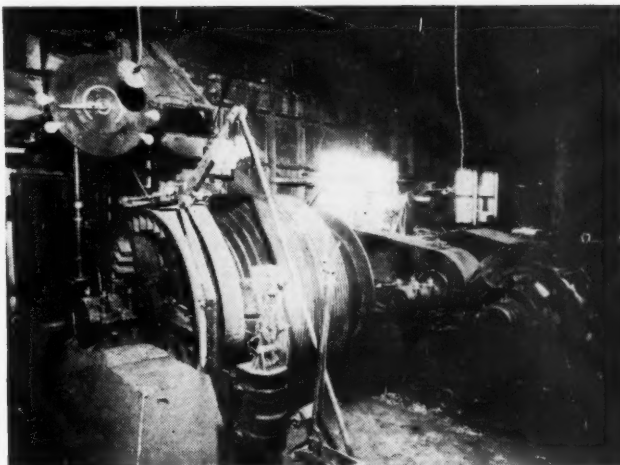
Subsidiary of Portland Equipment Co., 11 Broadway, New York 4, N. Y.

**Complete Liquidation . . . Immediate Delivery**

*... Three and one-half million  
dollars in new and nearly  
new coal mining machinery  
and equipment*



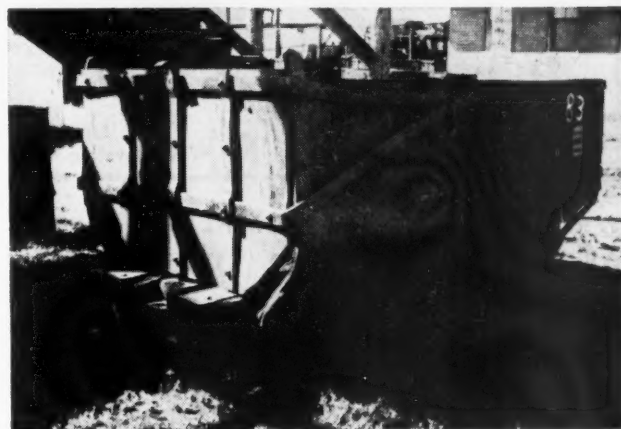
**ROTARY CAR DUMPER**  
Fast Dumping of Coal Cars



**Cornical Drum Hoist, 300 HP, Drum 8'-6" Dia. x 72" wide**



**Phillip's Crossover Dump and Car Retarder**



**Tipple Car, 2 Ton, 36" Gauge**

## HERE ARE SOME OF THE HARD-TO-GET OFFERINGS

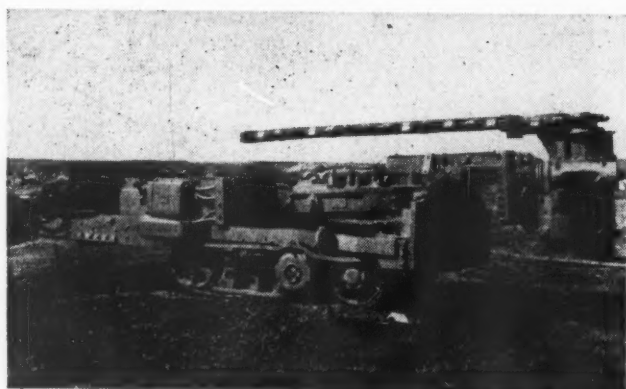
**HAULAGE MOTORS**, trolley type locomotive—250 Volt D. C.—electrically driven, 36" gauge, General Electric, Westinghouse, Jeffrey and Goodman.  
**COAL MINING MACHINES**—29 L-E "Arcwall" Jeffrey mining machines mounted on Joy electrically driven caterpillar trucks.  
Goodman Shortwall No. 112 mining machines.  
Goodman 36" Gauge **TRUCKS**, Type "M."  
**MINING MACHINE TRUCKS**—Joy "T-1."  
**MOTOR GENERATOR SETS**—I set 225 H.P. connected to Ridgeway 150 K.W. generators, with panelboards, A.C. and D.C. meters and transformers complete. 2 sets 300 H.P. connected to Ridgeway generators, 200 K.W., complete with panelboards, A.C. and D.C. meters and transformers. And others.  
**BATTERY CHARGING UNITS**—Joy, Westinghouse, Hobart Bros. Cr. Electric Products Co.  
**MOTORS**—A.C. and D.C., all types, 1 H.P. to 300 H.P., starting compelsators and switches.  
**TRANSFORMERS**—General Electric, Westinghouse, 7½ KVA, 37½ KVA and 50 KVA.  
**BOX CAR LOADERS**—Ottumwa—Manerre.  
**PUMPS**—Geared and centrifugal—motor and belt driven—Gould, Demming, and Myers.  
**FANS**—Jeffrey, American Blower, Sturdevant.  
**TIPPLE**—3 track tipple consisting picking screens, grizzlies, car retarders and dump, belt conveyors, elevator bucket conveyors, box car loaders complete.  
**VIBRATOR SCREENS**—Ty-Rock Tyler F-600 2 surface 5'x10' Screen, full floating.  
**SHAKER SCREENS**—"Marcus" shaker screens.  
**CONVEYORS**—Flight conveyors, elevator conveyors.  
**COAL CRUSHERS**.  
**RAILS**—200 tons 40 lb., 150 tons 60 lb., 350 tons 65 lb., 200 tons 75 lb.  
**SPIKES**, bolts, tie plates, frogs, switches, switch throws.  
**COPPER** trolley wire—2/0, figure 8 and 4.0 round.  
**TROLLEY HARDWARE**—Hangers, clamps, frogs, switches, roof hangers.  
**TRANSMISSION WIRE**—Single conductor, 2 conductor, 3 conductor—Neoprene, glass, rubber insulated 2/0 to 500,000 CM.  
**JOY 7-BU. LOADERS**—Caterpillar mounted with high pedestal.  
**SHUTTLE CARS**—Joy 42D storage battery.  
**ELEVATOR CONVEYORS**—Joy.  
**AIR COMPRESSORS**.  
**MACHINE SHOP**—Complete.  
**ELECTRIC SHOP**—Complete.  
**CARDOX PLANT**—Complete.  
**BATTERIES**—Exide and Gould Ironclad, 24 cells.  
\$150,000.00 WORTH of new parts, bearings, gears, bolts, nuts and screws for Joy, Jeffrey, Goodman, Ottumwa, Manerre, General Electric, Westinghouse, Demming, and other popular manufacturers' equipment.

ALSO THOUSANDS OF ITEMS TOO NUMEROUS TO MENTION.

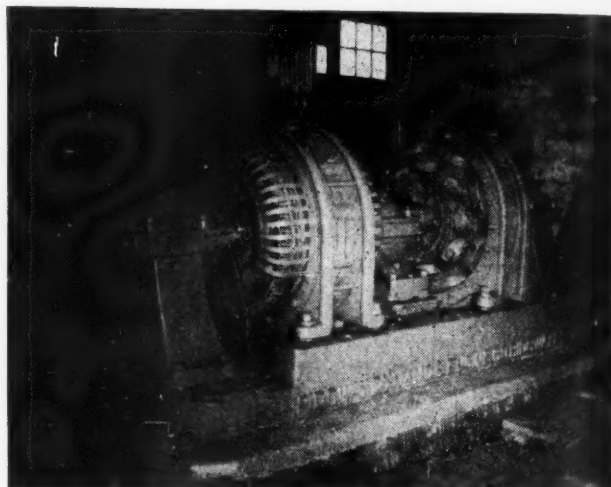
**WRITE FOR OUR COMPLETE LIST OF MACHINERY AND EQUIPMENT**

# COMPLETE LIQUIDATION IMMEDIATE DELIVERY

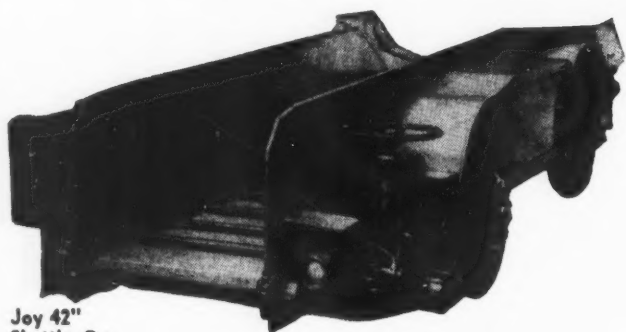
*... Three and one-half million  
dollars in new and nearly  
new coal mining machinery  
and equipment*



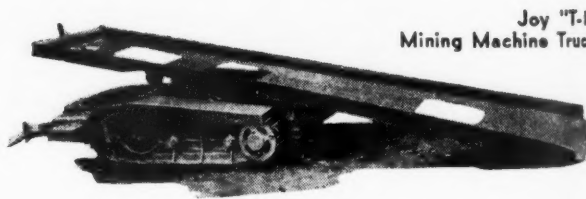
Jeffrey Arcwall 29 L-E Mining Machine



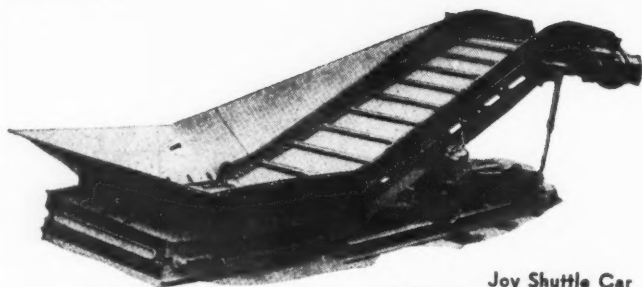
Motor-Generator Sets



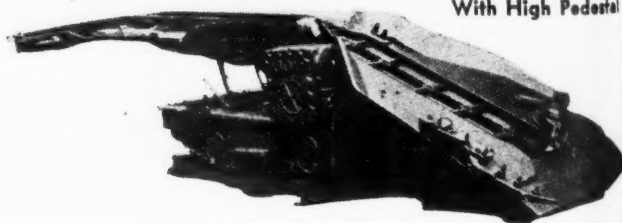
Joy 42"  
Shuttle Car



Joy "T-1"  
Mining Machine Truck



Joy Shuttle Car  
With Elevating Conveyor



Joy 7-BU Loader  
With High Pedestal

WRITE FOR OUR COMPLETE LIST  
OF MACHINERY AND EQUIPMENT

Subsidiary of  
Portland Equipment Co.

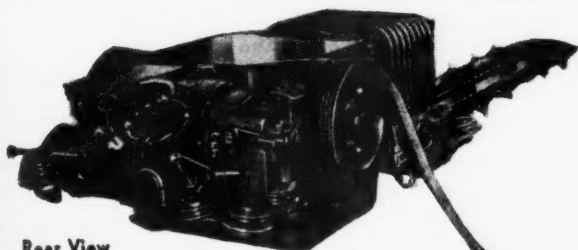
11 Broadway, New York 4, N. Y. 1669 BROADWAY, DENVER 2, COLORADO

SEE PAGE 201 FOR APPROXIMATE SUMMARY OF HARD-TO-GET OFFERINGS

## THE COLUMBINE MINE EQUIPMENT CO., INC.

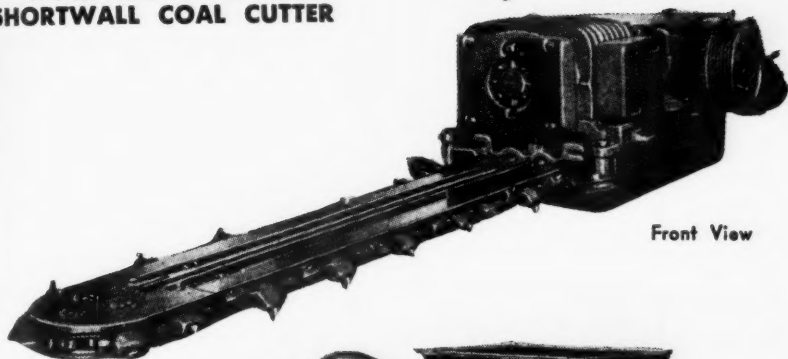
# COMPLETE LIQUIDATION IMMEDIATE DELIVERY

*... Three and one-half million  
dollars in new and nearly  
new coal mining machinery  
and equipment*

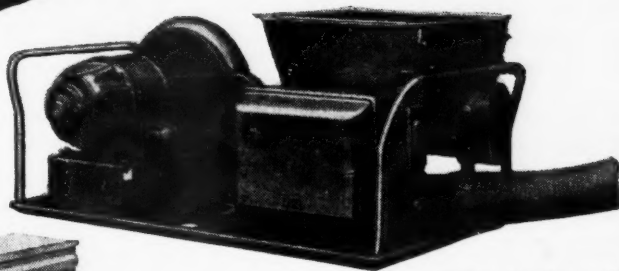


Rear View

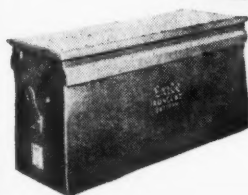
**GOODMAN TYPE 112  
SHORTWALL COAL CUTTER**



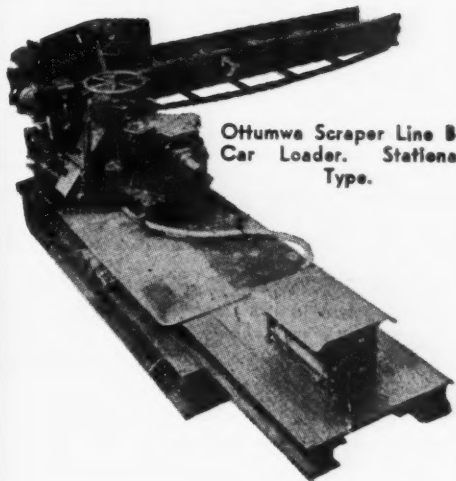
Front View



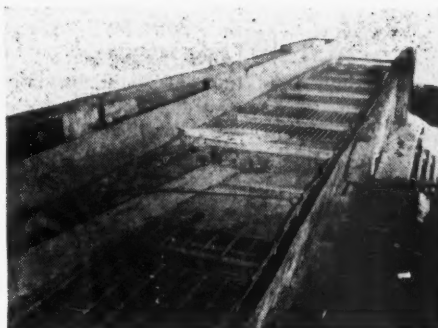
Safety Appliance Co.  
Rock Duster



Exide and Gould  
Ironclad Batteries



Ottumwa Scraper Line Box  
Car Loader. Stationary  
Type.



Partial View of Tipple with Grizzlies and  
Picking Screen.



Complete Cardox Plant, 160 Shell Capacity

TIPPLE CARS, 2 Ton Capacity, 36" Gauge End Dump, Roller and Ball Bearing.

ROTARY CAR DUMPER for 36" Cars With Automatic Control.

HOISTS—I Double Drum Conical Hoist—Denver Engineering Works—300  
HP., Silent Chain Drive, Complete With All Panelboards, Transformers and  
Controllers and Numerous Others.

## THE COLUMBINE MINE EQUIPMENT CO., INC.

FLAT IRON BUILDING, 1669 BROADWAY

DENVER 2, COLORADO

Subsidiary of Portland Equipment Co., 11 Broadway, New York 4, N. Y.

SEE PAGE 201 FOR APPROXIMATE SUMMARY OF HARD-TO-GET OFFERINGS



## FOR SALE

### LOCOMOTIVES—250 VOLT DC

2—13-ton Westinghouse, type 908-C  
 3—8-ton Westinghouse, type 906-B  
 6—8-ton General Electric, type HM-839  
 5—8-ton Goodman, type 32-1-4-T-2  
 6—6-ton General Electric, type HM-801  
 2—4-ton late type Goodman Gathering Locomotives, Serial Nos. 4926 and 4927, motors Type 142-04C, 250 volt, ball bearing, 1½" armorplate frame, equipped with Timken Bearing Journals and CY-21 floating type, motor driven reel with 300' of practically new cable, completely rebuilt and guaranteed.

### CUTTING MACHINES—250 VOLT DC

20—12-AA Goodman, 50 H.P.  
 12—112-AA Goodman Universal, 50 H.P.  
 5—112-CA Goodman Universal, 50 H.P.  
 22—CE-7 Sullivan Tip-turn trucks  
 3—Jeffrey late type 29-L Arcwall Machines  
 3—Jeffrey 29-LE Arcwall Machines

### LOADING MACHINES—250 VOLT DC

5—L-400 Jeffrey  
 2—260 Goodman  
 8—7-BU Joy  
 2—11-BU Joy  
 3—Myers-Whaley

### LOADING AND CUTTING MACHINES—220/440 VOLT AC

8—7-BU Joy. Just taken out of service  
 8—112-G3 Goodman Universal, tip-turn trucks, cable reel and cable

### ELECTRIC HOISTS

Several electric hoists from 150 to 1600 H.P. for shaft, drift, and slope mines.

### STEEL TIPPLES AND MISCELLANEOUS

We have several 3, 4 and 5-track steel tipples, complete with shaker screens, vibrating screens and all necessary appurtenances, suitable for shaft, slope, drift or strip mines.

1—Jeffrey 36" 6-ply Belt Conveyor, steel carrying frame, Timken Bearing carrying and return idlers, complete with motors and all necessary appurtenances, 1100' centers, used only a short time.

*We specialize in buying complete mines that are going out of business or from receivers in bankruptcy, administrators of estates, etc.*

## COAL MINE EQUIPMENT SALES CO.

306-7 BEASLEY BUILDING L.D. PHONE-34 TERRE HAUTE, INDIANA



Frank J. Wolfe

## FOR SALE

### COPPER TROLLEY & FEEDER WIRE

4/0 Round and Grooved—250,000 and 500,000 CM Stranded Cable.

### ROTARY CONVERTERS

100—300 and 500 K.W.—G.E. 600 Volt—1200 Speed.

### HAND WINCHES

Compact All Steel—3 ton capacity.

### STEEL BEAMS & ANGLES

10 Inch, 35# to ft.—2½" x 3" and 6" x 6" Angles.

### FOUR WHEEL TRAILERS

6.00 x 9 Pneumatic Tires, 21" O.A. Height for Supply Cars, Etc. Trackless Mines. 7" Rail Bonds 4/0—Asbestos Mittens—Safety Spectacles.

### LOCOMOTIVE CRANES

Standard Gauge 40-Ton Brownhoist—20-Ton Browning.

*Excellent Condition — Attractive Prices*

## MANSBACH METAL COMPANY

Logan, W. Va.

Phone 1071

## VIBRATING SCREENS CRUSHERS—SCALES

### Immediate Shipment

3'x6'—1 deck Vibrat. Screen.....	\$648.00
3'x6'—2 deck Vibrat. Screen.....	780.00
3'x8'—1 deck Vibrat. Screen.....	768.00
3'x8'—2 deck Vibrat. Screen.....	900.00
3'x8'—3 deck Vibrat. Screen.....	1164.00
Stoker Coal Crusher.....	474.00
Large Coal Crusher.....	1074.00
Coal Crusher with capacities to 215 T.P.H. ....	3540.00
15 Ton Truck Scale.....	578.00
20 Ton Truck Scale.....	702.00
5 Ton Tipple Scale.....	312.00

Many types of conveyors.

## BONDED SCALE COMPANY

2190 S. Third St., Columbus 7, Ohio

Phone GA 5712 UN 2832 Evenings

Visit our factory. We manufacture more than 150 models of Scales, Screens, Crushers, and Conveyors. Inspect several models in operation.

### FOR SALE

#### 36" GAUGE RAILROAD EQUIPMENT

6—10 - Yard Western, All - Steel Manually Operated DUMP CAR With Lift Doors.

PRICED TO MOVE:

**IRON & STEEL PRODUCTS, INC.**

42 years' experience

13480 S. Brainard Ave., Chicago 33, Illinois

**"ANYTHING containing IRON or STEEL"**

## RAILS NEW AND RELAYING

### TRACK ACCESSORIES

from **5** Warehouses

- PROMPT SHIPMENTS
- FABRICATING FACILITIES
- TRACKAGE SPECIALISTS

EVERYTHING FROM ONE SOURCE

**L. B. FOSTER COMPANY**

PITTSBURGH • CHICAGO • NEW YORK

**Locomotives, Shovels,  
Cranes, Crushers,  
Compressors, Hoists,  
Belt Conveyors,  
Screens, Feeders, etc.**

**A. J. O'NEILL**

**Lansdowne Theatre Bldg.  
LANSDOWNE, PA.**

Phila. Phones: Madison 8300-8301

### Save Time and Money With "Cardington"

New Booms and Fronts to Fit  
Your Equipment

Builders of tanks, towers, conveyors, special machinery, parts—to specifications.

Small shop stressing engineering, experience and workmanship.

Send for estimate on your requirements.

**Cardington Machine Works, Inc.**  
Cardington, Ohio Phone 213

## RELAYING RAIL

### TRACK ACCESSORIES

### MIDWEST STEEL CORP.

Gen. Off.: CHARLESTON 21, W. VA.

Warehouses  
CHARLESTON, VA.  
KNOXVILLE, TENN. • PORTSMOUTH, VA.

### RAILS—CARS

All sections of rails and good serviceable second hand cars, all gauges, also spikes, bolts, frogs, switches and ties.

**M. K. FRANK**

480 Lexington Ave.  
New York, N. Y.  
Reno, Nevada

810 Park Bldg., Fifth Ave.  
Pittsburgh 22, Pa.  
Carnegie, Pa.

## WESTINGHOUSE

### TYPE SK—MOTORS

### WIRE INQUIRIES COLLECT

### MOTORS, GENERATORS, TRANSFORMERS



**1 — 1500 H. P.**  
Bought and Sold  
New and Rebuilt

**ELECTRIC EQUIPMENT CO.**  
Rochester 1, N. Y.

# PRICES REDUCED

**We have just reduced prices on all our coal mining equipment and have cut some items up to 25%. It will pay you to get in touch with us on your requirements and take advantage of these reductions.**

## COAL CUTTERS

- 6—Sullivan CE-7 AC Short Wall, complete with Standard and Tip-turn Trucks, most machines with Power Cable.

## TROLLEY LOCOMOTIVES

- 1—4½ Ton Goodman equipped with Power Reel, 36" Gauge and Tyrex cable.
- 1—4½ Ton Jeffrey, with Crab Motor, 36" Gauge.
- 2—7½ Ton Goodmans, 36" Gauge.

## MACHINE SHOP EQUIPMENT

- 1—24"x10' American Quick Change Lathe.
- 1—20"x8' Monarch Quick Change Lathe—Motorized.
- 2—Drill Presses 16" to 26".
- 1—200 Amp. Smith Welder—on wheels.
- 1—18" Gould & Eberhardt Shaper.
- 1—Cleveland Combination Punch & Shear, 26" Throat.
- 1—Power Hack Saw, B.D.
- Bolt & Pipe Threaders, Chain Blocks, Swing Cranes with Crawls, Wood Planer, Saw Table, Hand Shears, etc.

## COAL WASHERS

- 2—Rheolaveur Launderers, 60—80 Ton Capacity, complete with Header, Feed Pipes, Supporting Frame, Dividing Head, Sampler and 10"x12' Steel Bin.

## COAL CRUSHERS

- 2—30"x30" Jeffrey Single Roll.
- 1—36" St. Louis Ring Type.
- 1—24x20 Swing Hammer Mill.

## JOY LOADERS

- 1—7-BU Joy Loader, Cat Mounted, Low Pedestal, 250 Volts DC, Overhauled and Guaranteed.

## PUMPS

- 1—2" Marsh, V-Belted to 15 H.P. Motor 150 GPM, 160' Head.
- 2—Ingersoll-Rand Motor Mounted, 150 GPM, 400' Head.
- 2—10x10 Allis-Chalmers Centrifugal, 1500 GPM, 56' Head, direct connected to a 100 H.P., 2300 Volt Center Drive Motor.
- 5—5x5 Deming Oil-Rite Piston Pumps—Motorized.

## RAILROAD SCALES

- 3—100 Ton Fairbanks, Steel I Beam Stringers, Inspected by W. W. & I. B. in April, 1947.

## COKE EXTRACTORS

- 2—Coke Extractors, 250 Volts DC, trolley operated, Std. R. R. Gauge.

## LARRY CARS

- 4—Connellsville Larry Cars, Trolley Operated, 6 Ton Capacity.

## CONVEYORS

- 3—24" Belt Conveyors, 15' to 85' Centers, 2 equipped with Ding's Pulleys.
- 1—30" Belt Conveyor, 370' Centers.
- 1—30" Belt Conveyor, 70' Centers.
- 1—36" Belt Conveyor, 50' Centers.
- 1—28" Apron Conveyor, 21' centers. Flight Conveyors from 12" to 30" up to 170' centers.

## RAILS

- 150 Tons—60# Relayers.
- 75 Tons—65# Relayers.

## MINE FANS

- 1—8-H60 Aerodyne Exhausting Fan, with Air Locks, Hood, etc. with 75 H.P. Motor—Purchased new in 1942.

## HOISTS

- 1—No. 22 Vulcan, with 40 H.P. Motor, Controller and Grids.
- 1—No. 22 Vulcan, with Man Cage, 30' Steel Head-frame and 40 H.P. Single Speed Elevator Type Motor, equipped with Solenoid Brake (Both Hoists purchased new in 1942 and 1944).
- 1—Single Drum Gasoline Hoist, direct connected to 2½x4¼ Wisc. Gas. Engine.

## PIT CARS

- 160—Card Iron Works R. B. Pit Cars, 36" Ga.
- 1—Card Iron Works Rock Car, 90 Cu. Ft. Cap.

## MINE LAMPS

- 188—Edison Model P Mine Lamps, with Charger and Racks.
- 5—Wolfe Safety Lamps.

## MISCELLANEOUS

- AC & DC Motors, new & used, from 2 H.P. to 75 H.P.
- R.C. Stranded Copper Wire, 2/0—4/0 & 350,000 CMS.
- Trolley Wire 2/0 & 4/0 Rd. & Fig. 8.
- Trolley Hangers and Supplies, New and Used.
- Wall Telephones, Jacks, \$20,000.00 worth of New Supplies.
- New CE-7 Sullivan Coal Cutter Parts.
- New and Used Wire Rope, ¾" to 1¼".
- 1,050' New 3-Cond. No. 6 All Rubber Power Cable.
- 1—3,000' Tramway, complete with buckets, etc.
- 1—750' Jig-back Tram, complete with motor.
- Office Equipment, Electric Calculators, Typewriters, Desks, Filing Cabinets, etc.

**WRITE FOR OUR COMPLETE INVENTORY  
AND SAVE MONEY ON YOUR PURCHASES**

# FLORENCE MACHINERY AND SUPPLY COMPANY

SUITE 904, EQUITABLE BUILDING

DENVER 2, COLORADO

C. J. Parrish, Mgr.

Phone: Alpine 2803

Yards: Denver and Florence, Colo.

## SHOVELS - DRAGLINES - DRILLS - ETC.

**Model 1201 Lima Combination Shovel and Dragline.** 80' boom, 3 yard bucket, 32' 6" boom, 22' stick, 3 1/2 yard dipper, Cummins Type L engine. Excellent condition.

**Model 1500 P&H Electric Dragline.** 135' boom, 3 1/2 yard bucket, 3 phase, 60 cycles, 2,300 volts. Excellent condition.

**Model 1400 P&H Electric Dragline.** 110' boom, 3 1/2 yard bucket, 3 phase, 60 cycles, 2,300 volts.

**95 Lorain Dragline.** Waukesha-Hesselman diesel engine. 75' boom, 2 1/2 yard bucket.

**K-580 Link-Belt Dragline.** 80' boom, 2 1/2 yard bucket, D17000 Caterpillar engine.

**K-48 Link-Belt Dragline.** 75' boom, 2 1/2 yard bucket, D17000 Caterpillar engine, Kohler light plant.

**802 Lima Dragline.** 70' boom, 2 1/2 yard bucket, Waukesha-Hesselman engine.

**855-B P&H Diesel Shovel.** 25' boom, 16' stick, 2 yard dipper.

**44-B Bucyrus-Erie Combination Shovel and Dragline.** Standard shovel front, 75' dragline boom, 2 yard bucket, Kohler light plant.

**855-B P&H Shovel.** 2 yard bucket, GMC diesel engine, standard front.

**K-480 Link-Belt Dragline.** 75' boom, 2 yard bucket, Waukesha-Hesselman engine. Very good condition.

**Model 806 2 Yard Osgood.** 23' boom, 20' stick and 2 yard dipper, D17000 Caterpillar engine.

**Model 77 Lorain.** 1 1/2 yard dipper, D13000 Caterpillar engine. Recently overhauled.

**Model 602 Lima.** 1 1/2 yard Combination Diesel Shovel and Dragline.

**34-B Bucyrus-Erie.** 1 1/2 yard dipper, D13000 Caterpillar engine.

**Model 362 Marion.** Standard shovel front, 1 1/2 yard dipper, D13000 Caterpillar diesel engine. Completely rebuilt.

**Model 705 Osgood.** 1 1/2 yard shovel front, 60' crane boom, 1 yard drag bucket, D11000 Caterpillar diesel engine.

**34-B Bucyrus-Erie Combination Front Shovel and Clamshell.** 50' clamshell boom, 1 1/2 yard dipper, D13000 Caterpillar engine.

**105 Northwest Combination Shovel and Crane.** 24' boom, 17 1/2' stick, 1 yard dipper, 35' crane boom, Twin City 4 cylinder gas engine.

**55 Lorain 1 yard shovel.** Gas engine.

**105 Northwest Shovel.** 24' boom, 22' stick, 3/4 yard dipper, Twin City gas engine.

**Osgood General 3/4 Yard Shovel.** Buda diesel engine. Completely rebuilt.

**Link-Belt Speeder 3/4 Yard Combination Shovel and Dragline.** 40' boom, Buda gasoline engine.

**Buckeye 3/4 Yard Combination Shovel, Backhoe, Dragline and Crane.** 8 cylinder Chrysler Industrial engine.

**Bay City 1/2 Yard Combination Shovel, Backhoe and Dragline.** Buda diesel engine.

**P&H Model 150 1/2 Yard Dragline.** Ford V-8 100 h.p. engine, 30' boom. Completely rebuilt.

**Model 44 Loomis Clipper Blast Hole Drill with New Hercules Engine.**

**Marlow 8" Diesel Pump.** Capacity 125,000 gallons per hour. 50' suction hose, 200' discharge hose. Used only 100 hours.

**315 cu. ft. Gardner Denver Caterpillar Diesel Compressor.** On steel wheels, with Wagon Drill. Outfit used 48 hours.

**315 cu. ft. Worthington Hercules Diesel Compressor with Wagon Drill** on rubber tired wheels. Excellent Condition.

**315 cu. ft. Jaeger International Diesel Compressor with Wagon Drill.** 4 months old.


**210 cu. ft. Davy International Diesel 2 Stage Air Cooled Air Compressor** on rubber tires.

**105 cu. ft. LeRoy Compressor.** Practically new.

*We carry in stock various sizes of Page automatic dragline buckets.*

*We may have the size you need for immediate delivery.*

**Phone 4910**



**FRANK SWABB EQUIPMENT CO.**  
Hazleton National Bank Bldg., Hazleton, Penna. Phone 4910-2 and 4911

### MOTORS

**2200V 60 CYC. 3 PH.**  
1—50 H.P. G.E. KR 527 1800 RPM.  
1—50 H.P. G.E. MT slipring, 695 RPM.  
1—60 H.P. G.E. West. CS SB 1800 RPM.  
1—100 H.P. G.E. KT 1800 RPM.  
1—100 H.P. G.E. I-K 1800 RPM.

**220 or 440V.**  
1—7 1/2 H.P. G.U.E. MT952, 1160 RPM. SB 440V.  
1—7 1/2 H.P. G.E. MT 760, 1800 RPM.  
1—7 1/2 H.P. G.E. MT 900 RPM.  
1—15 H.P. West. CW 900 RPM.  
3-5-7 1/2-10 H.P. Westinghouse SK 850 RPM. 230V. reasonable.  
1—20 H.P. G.E. MT 512, 1200 RPM.  
1—30 H.P. West. CI 638, 900 RPM.  
1—30 H.P. West. CI 960 RPM.  
1—30 H.P. West. CW 900 RPM.  
1—35 H.P. G.E. ITC 5012 1200 RPM.  
1—35 H.P. West. CI 652-D 690 RPM.  
1—50 H.P. West. CW 690 RPM.  
1—150 H.P. G.E. KTP 1800 RPM.  
1—50 KW West. MG set, 125 V. 1150 RPM., compound wound, complete with charging panels.

**PENN ELECTRICAL  
ENGINEERING COMPANY**  
SCRANTON, PA.

### AIR COMPRESSORS

2—175' CFM Inger-Rand 2 cyl. vert. 150 P.S.I. Type XIV, dir. con. to G.E. 50 HP. DC, motor, 230 V., 400 RPM. Mounted on factory cast iron base. Complete with intercooler, unloader and accessories.  
2—1,500 CFM Penna. 110 P.S.I. horiz. 2-stage, Class DCE-2, with direct motor drive, 300 HP. Elec. Mach. syn. motor, 3 ph., 60 cy., 2,300 V., 225 RPM. with intercooler and aftercooler and accessories. Request Bulletin D-100 for other compr. in stock.

**PHILADELPHIA TRANSFORMER CO.**  
Box 566 Dalton, Pa.

**RUBBER-COVERED CONVEYOR BELTING**  
Large quantity new 18" in lengths of 29' 8" only. 4 ply. 3/4" top, 1/32" bottom cover. Can be spliced. List price—\$3.15 per foot.

OUR PRICE—\$1.00 per foot

**The Finn Equipment Company**  
2525 Duck Creek Rd. Cincinnati 8, Ohio  
Tel. East 1125

### COAL CUTTING MACHINES

1—35B Jeffrey Shortwall, 250 V. D.C.  
1—35BB Jeffrey Shortwall A.C.  
2—20C, Jeffrey Areswall, 250 V. D.C.  
1—124 E. J. Goodman Slabbing, 250 V. D.C.  
1—36B Jeffrey Longwall, 250 V. D.C.  
1—12G3, Goodman Shortwall, A.C.  
1—12AB, Goodman, 250 V. D.C.

### LOCOMOTIVES

1—4-ton Jeffrey with MH 96 Motors & Reel  
1—5 1/2-ton Goodman, with 2 type 41, 250 V. motors  
1—5 1/2-ton Ironton Storage Battery Locomotive

### M.G. SETS

1—60 KW, 250 V. DC with 100 HP, Synchronous motor  
1—75 KW, 250 V. DC with 112 HP, Synchronous motor  
1—150 KW, Ridgeway, 275 V. DC, 3/60/2200/1200  
1—200 KW, Westinghouse, 600 V, 3/60/2200

### ELECTRIC MOTORS

1—500 HP, G.E. Slipring, 3/60/2200/600 RPM  
1—400 HP, Allis-Chalmers, SC, 3/60/2200/1150  
1—250 HP, GE, type I, Form M  
1—185 HP, Burke SC, 3/60/2200/1150  
1—150 HP, GE, Squirrel Cage, 3/60/900  
1—125 HP, GE, Squirrel Cage, 3/60/900  
1—100 HP, Synchronous Motor, 3/60/440/1200 RPM  
1—100 HP, GE, Squirrel Cage, 3/60/900 RPM  
1—40 HP, GE, 1200 RPM, 3/60/220-440 V  
4—25 HP, GE, Squirrel Cage, 3/60/865 RPM  
2—15 HP, Westinghouse, Squirrel Cage, 3/60/900  
2—10 HP, Westinghouse, CS, 3/60/440 V.  
1—7 1/2 HP, Squirrel Cage, 3/60/1800  
1—5 HP, Westinghouse, Squirrel Cage, 3/60/1800

### TRANSFORMERS

1—25 KVA, GE, 1/60/2200/220/110 V  
2—75 KVA, Westinghouse, 1/60/6600/2200  
3—125 KVA, Westinghouse, 1/60/2200/440/220

### COAL CRUSHERS

1—36"x36" Jeffrey S.R. Coal Crusher gear drive.

**TIPPINS MACHINERY COMPANY**  
Pittsburgh 6, Pa.

### LOCOMOTIVES

80 ton American 6 wheel steam switchers. New 1944.  
65 ton GE diesel electric. New 1942.  
45 ton Davenport diesel electric. New 1944.  
30 ton Whitcomb diesel. New 1943.  
8 ton Plymouth gasoline. New 1943.  
4 wheel. New condition.

**MISSISSIPPI VALLEY  
EQUIPMENT CO.**

511 Locust St. St. Louis 1, Mo.

### SPECIAL OFFERING

**Immediate Delivery**

62—50-Ton, All Steel, Twin HOPPER CARS, 1,880 Cu. Ft. Capacity. Cast Steel Side Frames and Bolsters.

*Good Condition.*

PHONE WIRE WRITE

**IRON & STEEL PRODUCTS, INC.**

**42 years' experience**

13484 S. Brainard Ave., Chicago 33, Illinois

**"ANYTHING containing IRON or STEEL"**

### FOR SALE

2 1/2 yard Diesel Dragline, Marion Model, 40A, 85 ft. boom. Excellent condition. Located No. Dakota.

**DAKOTA COLLIERIES CO.**

1017 Lumber Exchange, Mpls. 1, Minn.



# REBUILT EQUIPMENT — READY TO SHIP

## MOTOR GENERATOR SETS—250 V. D.C.

(Motors 220/440 or 2200 v., 3 ph., 60 cy.)

No.	KW	Make	Speed
1	200	G. E.	1200
2	150	Allis-Chal.	1200
1	150	Ridgway	900
2	150	Star	1200
1	125	Star	1200
1	100	G. E.	600
1	100	G. E.	1200
1	100	Star	1200
2	75	West.	1800
1	50	West.	900
1	60	West.	900
2	40	West.	900
2	30	West.	1750
1	25	West.	1200
1	20	G. E.	900

## D.C. GENERATORS—250 Volts—D.C.

No.	KW	Make	Speed
10	10	West.	1150
11	15	West.	1400
2	15	West.	1150
2	20	West.	1400
5	25	West.	1400
4	25	West.	1150
3	40	West.	850
5	50	Louis Allis	1150
4	75	Star	1150
5	100	Star	1200
3	125	Star	1150

## AC GENERATORS—2200/4000/440/220 V.

1—110 KVA Allis Chal., 277 rpm.  
1—450 KW Elec. Mach., 120 rpm.  
1—1250 KW West. 80% P.F., 1200 rpm.

## D.C. MOTORS — 230 Volts

No.	H.P.	Make	RPM	Type
1	175	G. E.	450	MD
5	150	Star	1800	F-92
5	125	Star	1150	
1	125	West.	1400	S-10
4	125	West.	1800	F-9
1	100	West.	700	S-12
4	100	Star	1800	
1	80	West.	450	
1	75	West.	575	SK-183
2	55	West.	650	SK-121
2	40	West.	625	MC-6f
3	40	Cr. Wheel.	1700	CM
1	40	West.	625	MC
1	35	G. E.	700	SK-140
1	30	G. E.	530	DLG
1	30	West.	700	LC
1	30	C. Wh.	1750	CMC
1	30	Allis-Chal.	950	
1	25	West.	600	SK-134
1	25	West.	600	SK-113
6	25	West.	825	SK-120
5	25	West.	1150	SK

1	25	West.	1750	SK-83
3	20	Reliance	850	131
6	20	West.	975	S
3	20	West.	900	SK1001
5	20	West.	1150	SK-93
3	20	West.	1750	SK-83
10 new	20	Delco	1800	ball-br
2	20	G. E.	3600	CD
3	15	West.	560	S-7
2	15	West.	900	SK
12	15	West.	1150	SK-83
24	15	Delco	1800	
15	10	West.	850	SK-83
6	10	West.	1150	SK-63
4	10	West.	1750	SK-43

## 230 V. D.C. MAGNETIC STARTERS

### AND CONTROLLERS

- 456—New 1 HP. Cutler Hammer across the line.
- 111—New 1 HP. Cutler Hammer across the line.
- 30—New 2 HP. Cutler Hammer across the line.
- 55—New 5 HP. Cutler Hammer drip proof, 2 step current limit OL and LV.
- 58—New 7 1/2 HP. Cutler Hammer.
- 60—10 HP. Cutler Hammer Magnetic.
- 12—10/15 HP., 230 V. Westinghouse Magnetic Drip Proof Controllers, 2 steps acceleration thermal overload relay with stop, start and reset buttons.
- 9—New 10/15 HP., 230 v. G.E.
- 10—New 20/35 HP., 230 v. Ward Leonard Magnetic.
- 10—New 40 HP., 230 v. G.E. Magnetic.

## A.C. MOTORS—4000/2200/220/440 V.—

3-Ph., 60 Cy.

No.	HP.	Make	Rpm.	Type
1	500	Elec. Mach.	120	Syn.
1	750	West.	1200	Syn.
1	1000	West.	1200	Syn.

## 12,000 CFM AMERICAN BLOWER FANS

4—NEW Centrifugal Fans, dir. con. to 12 1/2 HP., 2 speed, A.C. or D.C. Motors.

## CONVEYORS

- 3—G-20 Goodman Shaker Conveyors each with a Goodman Duck Bill complete with motor equipment with 250 v. DC motors.

## PUMPS—Equipped with AC or DC Motors

- 1—11 GPM 460 ft. head Worthington Oil.
- 1—68 GPM 479 ft. head Gould Pump.
- 1—100 GPM 50 ft. head Dayton Dowd.
- 1—130 GPM 50 ft. head Dayton Dowd.
- 1—160 GPM 50 ft. head Dayton Dowd.
- 1—195 GPM 200 ft. head National Transit.
- 1—210 GPM 60 ft. head National Transit.
- 1—220 GPM 231 ft. head 3 1/2"x3" Blackmer.
- 2—243 GPM 100 ft. head Dayton Dowd.

- 1—300 GPM 90 ft. head Dayton Dowd.
- 2—300 GPM 20 ft. head Gardner-Denver.
- 3—378 GPM 44 ft. head Dayton Dowd.
- 1—450 GPM 104 ft. head Dayton Dowd.
- 1—600 GPM Morris Machine Wks. 4" suc., 4" dia., 123 ft. head, 1750 rpm.
- 1—650 GPM 88 ft. head Dayton Dowd.
- 3—750 GPM 70 ft. head Dayton Dowd.
- 1—4000 GPM 138 ft. head Ingersoll Rand.

## HOISTS or WINCHES

- 200—1 1/2-ton Hand Cranked ration 27:1 thru an enclosed double reduction gear unit with 4 planetary gears mounted on steel plate complete with 48' of 1/4" cable, ratchet type brake, push button release.

## CAR PULLERS

- 100—Brand New with 1/4" cable, 1 1/2 and 2 ton A.C. or D.C. Motors.

## FIRE PUMPS

- 3—1,000 GPM Worthington, 150# delivery pres. head or test pres. 225 lbs., dir. con. 133 HP., 875/1750 rpm., 230 V. D.C. G.E. Motors and controllers.

## COMPRESSORS

- 1—315 CFM. Ingersoll Rand Portable, 100 lbs. pres., driven by 105 HP. Waukesha Oil Engines, 860 rpm.

## STORAGE BATTERY LOCOMOTIVE

- 1—40-ton Goodman type M with Edison 63-G-18 battery with 2 motors, 11 hp., 80 v. with double reduction gear, speed 3 1/2 MPH, 2,000 lbs. draw bar pull. Spare set of batteries and battery box, also spare parts.

## ENGINE GENERATOR SETS

- 6—New 1 kw., Homelite portable, 14.25 Gas
- 3—New 1 1/2 kw., Homelite, 115 v. 1 ph. 60 cy. portable Gas
- 3—1 1/2 kw., Homelite, 14.25 v. D.C., portable Gas
- 6—2 kw. NEW Homelite, 28.5 v. D.C. Gas
- 1—5 kw., Engborg, 230 v. D.C. Steam
- 3—5 kva., 120/240 v. 1 ph. 60 cy. dir. con. to 6 HP. Witte DIESEL
- 1—7 1/2 kw., 120/240 v. 1 ph. 60 cy. Master dir. con. Wisconsin air-cooled Gas Eng.
- 2—10 kw., 120 v. D.C. 1200 rpm., dir. con. to Hercules Diesel
- 3—New 25 kw, 120/208 v. 3 ph. 60 cy. Westinghouse dir. con. to 4 cyl. 70 HP. Lerol Gas Engine
- 2—25 kw., O'nan Gas Engines, 220/440 v. 3 ph. 60 cy.
- 2—30 kw., G.E. 125 v. Buda DIESEL
- 2—30 kw., 230 v. D.C. Buda DIESEL
- 1—35 kw., Ridgway 220/360 Steam
- 2—30 kw., 110/220 v. 60 cy. 1200 rpm Rogers DIESEL
- 1—125 kva., 220 v. 3 ph. 60 cy. Erie Ball STEAM

# DUQUESNE ELECTRIC & MFG. CO., PITTSBURGH [6], PA.

Montrose — 5800

## FOR SALE

### CRUSHERS

- 1—Stephens Adamson 30x30 double roll crusher. Will crush from 2" down to 1 1/4".
- 1—Link Belt 36x60 double roll crusher, equipped with gear drive.
- 1—American Pulverizer crusher #1627. Type AC, machine number AC3B, crushes from 20" down to 1/2".
- 1—Jeffrey 30x30 single roll crusher.
- 1—McNally Pittsburgh double roll crusher.
- 1—20x20 Link Belt double roll crusher.
- 1—Jeffrey single roll crusher, size 36x36, No. 4507. Will crush maximum lump of 20" at rate of 250 tph to a product of 1 1/4" when operating at 300 rpm. Direct connected by flexible coupling to 75 HP G.E. motor, 3/60/440, speed full load 885, ball-bearing, fan cooled.

### FAN

- 1—Bayley #17 Plexiform fan, Type F, wheel diameter 93 1/2", circumference, 24.478 ft. outlet area, 39.374 sq. ft. Capacity ranges from 39.376 CFM at outlet velocity of 1,000 to 141.759 CFM at outlet velocity of 3,600.

### LOCOMOTIVES

- 1—6-ton Goodman locomotive, serial number 4227, type 3904T, steel tires, plain bearings, 36" gauge.
- 2—4-ton Westinghouse locomotives, serial numbers 46077 and 46353, ball bearing, 36" gauge.
- 1—5-ton Goodman locomotive type W12A5, #963, overall dimensions, length 11', height 30", width 47", wheelbase 31", 42" gauge.
- 1—10-ton General Electric locomotive, serial No. 8909, 60" wide, 14'6" long, 38" height on rail, 36" gauge.

- 1—6-ton Goodman locomotive, 36" gauge, type W1.2, 250 volts, serial No. 32A.

- 1—4-ton Mancha battery locomotive, equipped with Gould batteries.

- 1—6-ton G.E. locomotive, classification LM2T6MM5—serial number 5837, 250 volts DC, 36" gauge, 45" wide overall, height 33", overall height 38 1/2", wheelbase 44", 30" wheel diameter, overall length 13", R88E type controller.

### MINING MACHINES

- 2—Sullivan type CH18, AC longwall mining machines, 3 phase, 60 cycle, 220 volt, 30" cutter bars, complete with 300' each of 3 conductor mining machine cable.

- 2—Goodman Universal mining machines, type 112G3, 36" gauge.

- 5—Goodman type 512DG3A, AC shortwall mining machines. Complete with cable and jacks. 8" cutter bars. No trucks.

- 1—Jeffrey 35BB, AC shortwall mining machines. 6" cutter bars, complete with tip turn trucks, cables and reels.

- 1—Sullivan shearing machine type CH11, 250 volts DC, 42" gauge, 7 1/2" cutter bars.

- 1—Goodman Universal mining machine, 112AA, 42" gauge, 250 volts DC, 8 ft. cutter bar.

- 1—Goodman Universal 112EG3A, AC Shortwall mining machine, 3 phase 60 cycle, 230 volts, 6" cutter bar complete with cable and reel.

### HOISTS

- 1—Ottumwa Iron Works single rigid cylinder-conical drum hoist, serial number 6090, complete with remote control and hydraulic brakes, constructed for following hoisting conditions: Weight of cage 6000±, weight of car 1000±, weight of coal average 3500±, total cage travel 277 ft. (HMD) size of rope 1 1/4", trips per hour 78, rest period, 15 sec. Balanced hoisting without slack rope, end lift. Post brake 72" diameter, 8" face. Direct connected to Western Electric 150 HP motor, 3 phase, 60 cycle, 2200 volts, slip ring, speed full load, 700 RMP, complete with automatic switch-board.

Other types and sizes of hoists, with and without motors.

### PUMPS

All sizes and types of pumps.

We are distributors for John A. Roebling's Sons Company wire rope and fittings.

# GAVENDA BROTHERS, Inc.

CANTON, ILLINOIS

**MINING MACHINES**

Jeffrey: 2-35B, 28A, 250 V. 1-24B Low Vein. 4-29B, 29C, 29OE with shearing head. Also 1 on cats. Revolving head for 29C. 2-Longwall 24B.  
 Goodman: 12A, 12AB, 12AA, 12G3A, Short-walls. 424, 24B, 124EJ Slabbers.  
 1-12G3, 220 volt and 2-17 DA, 2 DA, 500 volt.  
 2-Permissible Type 13CA, 6-112AA.  
 Motors for 212 G3-Volts 220. Phase 3.  
 1-Hitch Cutter for Cross Head timbers.  
 2-Goodman Slabbing Machines, permissible type, 250 and 500 volts.  
 3-Longwall Low Vein Type 11AA on self-propelling truck 250 V.  
 Sullivan: CE7, CE9, CE10, CR10 Low Vein.  
 1-Buddy Sullivan 220 Volt, 3 Phase.

**SUBSTATIONS - 275 volts, D. C.**

1-150 KW, G. E. MG Set.  
 1-300 KW Westing. Rotary. As is armature needs rewinding.  
 1-150 KW West. MG Set.  
 1-100 KW Ridgway MG Set.  
 1-200 KW H W Rotary Converter.

**LOCOMOTIVES**

Goodman: All 250 volts.  
 1-6 ton, 30B, 43" 1-5 ton.  
 1-5 ton 8-30 36" gauge.  
 1-6 ton type 8A.  
 1-5 ton type 42-0-4-2.  
 Westinghouse: All 250 volts.  
 906 motors and 102-904-115.  
 Bar steel frames 10 ton, 6 ton, and 4 ton.  
 G.E.: All 250 volt.  
 6 ton 803, 44" as is.  
 6 ton 823, 44".  
 6 ton 801.  
 8 ton 839.  
 1-8 ton type HM 61.  
 6 ton 819-821.

**LOCOMOTIVES**

5 ton 825, 44" and 36".  
 8 ton 829.  
 2 motors for 8 ton 839.  
 Jeffrey: 8 ton, 250 volts, type MH73. 1-4 ton MH 12. Locomotive motors and Crabs and Reels for Locomotives.

**SPARE ARMATURES**

Jeffrey: MH110, MH78, MH73 and MH64-300 V. and 500 V. 29B, 35B and 28, 35BB, 35A, 29C, 29L, 35L.  
 Goodman: 34B, 30B, 30C, 12A, 2600 K and R; 12AB, 12AA, 33-1-4-T, 31-1-4-T, 32-1-4-T.  
 General Electric: 801, 807, 819, 821, 825, 839, 61.  
 Westinghouse: 904, 905, 906, 102, 907, YR2, 115. Also 200 KW.  
 200 KW Westinghouse Rotary Converter Armature: 250 V. Bracket Type, 150 KW G.E., HCC Bracket Type.  
 Sullivan: CE7, CE9 and CE10.

**OTHER ITEMS AVAILABLE**

Aerial Tramways.  
 Automat Loader: 1 Myers-Whaley #4.  
 Belt Conveyors: 1 Bucket Elevator Conveyor.  
 Bit Sharpeners, 2 Sullivan, 1 Diamond.  
 Blue Print Machine: 42" wide, continuous Mercury Arc Light.  
 2 Loading Booms: 40'x5' with Picking Table.  
 Bond Welders: Resistance.  
 Circuit Breakers: AC and DC.  
 Circuit Breakers, Automatic: 250 volt, 600 amps.  
 Circuit Breakers, Manual: 600 amps to 3,000 amps.  
 Clam Shell Bucket: 1 1/2 cubic yard.  
 Coal Crushers: (double roll) 16"x16", (single roll) 24"x30", 24"x24", 36"x36", 30"x30", 18"x18", 12"x16".  
 Conveyors: Scraper type.

**OTHER ITEMS AVAILABLE**

Compressors & Jackhammers, Compensators.  
 Drop Bar Supports: (Gooseneck) 29B and 29C.  
 1 Revolving head for 29C.  
 Dumps: Crossover.  
 Field Frames.  
 Generators: DC 250-275 volt, 30 KW to 100 KW. 1-50 KW 3000 R.P.M., 250 Volt.  
 Hoists:  
 Hoists: overhead, AC 3-60-400 1 ton and 2 ton. Crabs and Room Hoists.  
 Lathes: 48"x14" with Taper Attachment and 3-60-220 Motor.  
 Loading Machines: Myers-Whaley.  
 Milling Machines, horizontal and vertical.  
 Mine Cars: 48" gauge.  
 Mining Machine Trucks.  
 Motors: Miscellaneous and 1-50 HP Fynn Welchel, 1800 RPM, 220 Volt, Slipring or synchronous Crane type. 1-oilwell motor, 2 speed 575 and 1160-HP, 15' and 35', 440 volts. Slip Ring with control and pole changer and series motors.  
 Motor Starters and Controllers: AC and DC.  
 Plants: Diesel Power. Synchronous Motor Starters, full Magnetic Across-the-line, 3 phase, 60 cycle. 4-150 Volts-2-200 H.P. and 6-250 H.P. Westinghouse starters, automatic, magnetic, reversible.  
 Synchronous motor starters and starters.  
 1-165 H.P. 440 volt with resistance for slip ring. Motors, 1-100 H.P. 250 volt DC.  
 1-Bread mixer with AC motor.  
 Belting 400 ft. 25".  
 Pulley flat belt-V and conveyors.  
 Plants natural gas 300 H.P. with DC.  
 Generators 250 volts and smaller sizes.  
 Pumps: Rebuilt and New.  
 R. K. Switches: 85# and 100#.  
 Shute Larry: 2-Myers-Whaley, #3 and #4.

**GUYAN MACHINERY COMPANY,**

**Logan, W. Va.**

**STRIPPING & MINING EQUIPMENT**

Coal Crushers  
 Conveyors  
 Vibrating Screens  
 Electric Generator Sets  
 Electric Coal Drills  
 Mine Fans

**THE INDUSTRIAL EQUIPMENT CORP.**

(Established 1902)  
 910 First National Bank Bldg.,  
 Pittsburgh 22, Pa.  
 Warehouse: Carnegie, Pa.

**AIR COMPRESSORS:**

12-Belted 360, 676, 870, 1000, 1300 ft.  
 12-Diesel 105, 315, 520, 676 & 1000 ft.  
 6-Electric 1300, 1500, 2200, 5000 ft.

**CARS & LOCOMOTIVES:**

100-50 ton cap. Gondolas.  
 35-50 ton cap. Flat Cars.  
 4-35 & 65 ton Diesel Locomotives.  
 6-10, 16, 20 & 30 ton Gas Locomotives.  
 150-8000 & 10,000 gal. cap. Tank Cars.  
 20-12 yd. Std. ga. Steel Dump Cars  
 1-50 ton G.E. Diesel Elec. Locomotive.

**RUBBER CONVEYOR BELTS:**

1000' 60", 600' 30", 300' 20", 1000' 42", 900' 48", 1450' 36", 1200' 24", 900' 18", 600' 16", 350' 14".

**ELECTRIC LOCOMOTIVES:**

15-3, 5, 8 ton Battery & Trolley.

**DIESEL GENERATORS:**

12-100, 150, 180 & 480 K.W.

**MINE LOADERS:**

17-GD9, Elmer 21, Conway 20, 50, 60 & 75 and Sullivan HLS.

**STEEL TANKS:**

6-50,000 and 100,000 gal. Tanks on tower.  
 30-8000, 10,000 and 20,000 gallon capacity.

**SHOVELS - DRAGLINES:**

7-1 yd., 1 1/2 and 2 yd. Gas & Diesels.  
 16 yd. Elec. 160 ft. Boom Dragline.

**R. C. STANHOPE, INC.**

60 E. 42nd Street New York 17, N. Y.

**HIGH GRADE TOOLS**

30" King Vertical Boring Mill, 1 head.  
 24" and 42" Bullard Vertical Turret Lathes.  
 60" Bullard Vertical Boring Mill.  
 20 Fostick Horizontal Boring Mill, 3" Bar.  
 25 G & L Horizontal Boring Mill, 2 1/2" Bar.  
 18"x10" Boye & Emmes Lathe.  
 20"x14" Boye & Emmes Lathe.  
 24/48x10" Rahn-Larmon Gap Lathe.  
 20/40x14" Schumacher & Boye 2-spdl. Lathe.  
 22 and 24 Cincinnati Plain Millers.  
 2' to 6' Plain Radial Drills.  
 21" Cincinnati Upright Drill.  
 15" Weigle Upright Drill.  
 26" and 24" G & E Shapers.  
 26" Smith & Mills Shaper.  
 30"x30"x10" Cincinnati Planer.  
 36"x36"x12" Gray Planer.

Also various other machine tools.

Send us your inquiries.

**Cincinnati Machinery Company, Inc.**  
 217 E. Second Street Cincinnati 2, Ohio

**NEW and REBUILT STORAGE BATTERY**

**LOCOMOTIVES**

1 1/2 to 10 Ton 13" to 56" Track Gauge  
**GREENSBURG MACHINE CO.**  
 Greensburg, Pa.

**REBUILT MINING MACHINES**

2-122 AA Goodman 250 Volts  
 1-112 G3A Goodman 220 Volts  
 2-12 A and 12 AB Goodman 250 Volts  
 4-CE 7 Sullivan AC and DC

**LOCOMOTIVES**

1-Elec. Hoist, 40 H.P. Motor  
 1-6 ton GE Trolley and Battery combination  
 1-6 ton Goodman type 2600 250 Volts  
 2-T. B. Sullivan 250 V. D.C.

**LOADING MACHINES**

1-7 BU Joy 250 Volts 42" gauge  
 2-5 BU Joys 250 Volts 42" gauge  
 1-8 BU Joy 250 Volts 42" gauge

**THOMAS GILLESPIE & SONS**

State Road 67, BICKNELL, IND.  
 Phones 179 and 149-K

**PIPE - MACHINERY - GAS ENGINES  
 AIR COMPRESSORS - DIESELS - PUMPS**

Some Steam Engines and Boilers available only slightly above the metal price

**BRADFORD SUPPLY COMPANY**

WAYNE, WOOD COUNTY, OHIO

Near Toledo

**Electrical Equipment**

Converters, Motor Generator Sets, A. C. & D. C. Motors, Control Equipment and Transformers.  
 We build equipment to fit your requirements. Over 25 years engineering background.

**C. B. LOCKE CO.**  
 P. O. BOX 3227  
 TEL. 38-136  
 CHARLESTON, W. VA.

**NEW and REBUILT**

**IRON and STEEL PIPE**

New and Used

Large stocks, all sizes  
 attractive prices

**L. B. FOSTER COMPANY**

P. O. Box 1647 Pittsburgh 30, Pa.

FOR BUYING OR SELLING  
 USED MINING EQUIPMENT  
 CONTACT US FIRST!

**MINE EQUIPMENT EXCHANGE**

BOX 170

BLUEFIELD, W. VA.



# CALL MOORHEAD

## FOR MINING EQUIPMENT

### GOODMAN SHAKER CONVEYORS

3—Goodman G 20 Shaker Conveyors with 260 v. 20 HP motors, also Goodman #3 Duck Bills.

### MINING MACHINES

1—35B Jeff. Perm. 250 v. 6" Jeffrey Chain & Bar on revolving trucks.  
1—35B Jeff. Perm. 500 v. 7½" Clin. Chain and Bar on revolving trucks.

### STORAGE BATTERY LOCOMOTIVES

1—6 Ton G.E. permissible 36/44 Ga. HM 825 BB.  
4 Ton 36" Ga. Atlas 2 BB Motors.  
1—5½ Ton Ironton Type A 36/42" Ga.

### Haulage & Gathering Locomotives

13 Ton Westgh. 250 v. 36" or 40" Ga.  
2—6-ton G.E. 250 v. HM 803 BB Motors, 36" Ga. O.S. Boiled Steel frame with flat top motor driven reel.  
10 Ton Goodman 36BOIT O.S. fr. 250 v. 36" Ga.

### COAL CRUSHERS

18x24 and 18x30 New Scottdale dbl. roll.

### Rotary Con. & MG Sets (3 ph. 60 cy.)

750 KW G.E. 550 v. 1100 HP Syn. 4600 v.  
640 KW Al. Ch. 250 v.—800 HP Syn. 2300 v. (available 2 months).  
2—300 KW G.E. 275 v.—435 HP Hyn. 440 v. (available 6 months).  
1—150 KW Rldg. 250 v.—225 HP Syn. 2300 v.  
100 KW Burke 125 v.—2200/440/220 Syn.  
50 KW G.E. 125 v. 75 HP G.E. 2200 v. 440/220 v.  
35 KW Cr. Wh. 250 v.—50 HP 220/440 v.  
3—New 10 KW 125 v. 220/440/3/60.  
7½ KW Wootton 125 v. 10 HP. Wootton Vert.

### DC MAGNETIC STARTERS

New 230 v. DC Magnetic Cutler Hammer. Starters, 25, 40, 50, 60, 75 & 100 HP.

### SLIP RING & SQ. CG. MOTORS

HP	Make	Speed	Wdg.	Type
1400	West.	1200	Syn.	New 1 P.F.
1000	West.	1200	Syn.	New 1 P.F.
750	West.	1200	Syn.	New 1 P.F.
600	West.	900	S.R.	OW NEW
435	G. E.	450	Syn.	ATI
300	West.	1800	S.R.	CW
250	West.	277	S.R.	CW 1314
200	G. E.	340	S.R.	MT 412
150	West.	720	S.R.	CW
100	West.	1750	S.R.	C-1
100	G. E.	500	S.R.	M 1-25-cy.
60	G. E.	1100	S.C.	KT343
50	West.	560	S.R.	CW 658 D
50	G. E.	900	S.R.	1-M

### HOISTS, CRANES & PUMPS

400/500 HP Flory slope Fixed drum 6" dia., 5' fact. 9" flanges—22000# rope pull.  
400 HP Vulcan conical drum shaft Hoist.  
100 HP Vulcan fixed drum 100 HP G.E. S.R. Motor.  
1—50/75 HP 2 drum Meade Morrison slope.  
75 HP Otumwa slope with AC Motor.  
75 HP Vulcan 2 drum shaft. S.R. Motor.  
40 HP Lidgerwood sgl. ft. drum geared to A.C.  
25 HP sgl. friction Hoist—230 v. DC Motor.  
15 HP Otumwa sgl. fr. tdr.—15 HP. SK 230 v.  
10 Ton Larry Car, 500/250 v. DC.  
10 HP Fridy Car Puller, AC Motor.  
10 HP Flory sgl. fric. 22" D. 18" F8" flanges.  
4—10 Ton Chisholm Moore Chain Hoists.  
2—Fairmont Car Retarders.  
1—1 Ton AC Monorail 220/3/60.  
4—2720 GPM 85" Le Courtney Bronze fitted 10".  
1—700 GPM 60" Wheeler Bronze Fitted 5" Cent.  
625 GPM 12" Hd. De Laval 10 HP 230 v. DC.  
300 GPM 25" Hd. De Laval 1½ HP 230 v. DC.

300 GPM 44" Hd. DeLaval 10 HP. 230 v. DC.  
150 GPM 52" Hd. DeLaval 5 HP 230 v. DC.

### DC MOTORS GENERATORS, 230/250 v.

HP	Make	Speed	Wdg.	Type
1200KW	Al. Ch.	750	cpd.	500 v.
1500	West.	600	sh.	600 v.
175	G. E.	475	ser.	MD 109
130	G. E.	550	ser.	CO 1812
100	G. E.	480	ser.	MD 108
60	West.	1750	sh.	SK 120L
50	Northern	400	ser.	K
50	G. E.	250/1000	sh.	RF16
50	Reliance	1750	cp.	166 T
40	G. E. (Vert.)	1750	cp.	CD 93
40	Roth	1500		
35	Reliance	700	cp.	CM
35	C. Wh.	700	sh.	S
25	West.	325/975	sh.	SK 63
15	West.	800	cp.	SK 93
15	Wh.	800	sh.	CM
15 (4)	C. Wh.	1400/1700	sh.	CM
13	West. (Enc.)	835	cp.	SK 113
10 (2)	G. E.	1750	sh.	CD
7½	G. E.	1750	sh.	RL

### AIR COMPRESSORS

1200 cu. ft. 100# Worthington 2 stage Belted.  
750 CFM 100# Ch. Pa.—150 HP West. S. R.  
1—373 cu. ft. 100# Bury-AC Motors.  
173 cu. ft. 100# Pres. Chic. Pneu. Belted.  
1—80 cu. ft. 100# Pres. Chic. Pneu. Belted.  
1—75 cu. ft. 100# Chg. Pneu.-AC Motor.

### AC MAGNETIC STARTERS (3 ph. 60 cy.)

2—700 HP West. 2300 v. Syn. Motor Starters.  
200 HP G. E. Rev. Hoist Control, 2200 V.  
1—125 HP. 440 v. Enc. reduced v. Comp.

**MOORHEAD-REITMEYER CO., INC.**

**Mayflower 7900**

**Pittsburgh 19, Penna.**

Serving the Coal Industry for more than a Quarter of Century

**NOW** install your own!  
**Quick, 2-Way Communication**  
WITH  
**ARMY FIELD TELEPHONES**



Performance equals best present day commercial telephones up to 17 miles!

**BATTLEFIELD PROVEN**  
•  
**EASY TO USE**

### CANVAS CASE

Now you can quickly establish on-the-job 2-way communication from office or temporary headquarters . . . on the surface or underground. Easy to install. Just hook up terminals to any two-strand wire; up to four phones on same line if desired, without switchboard.

Operates on standard flashlight batteries. Compact . . . rugged . . . portable. Saves time. Promotes safety . . . efficiency. Every shipment includes free 50 ft. sample new army field wire.

### Write for Free Folder!

NEW per pair, complete with heavy canvas case, \$29.50; Leather, \$32.50.  
USED per pair, complete, either case, \$19.50.  
Compact, portable Switchboards—for systems of 4 to 24 phones:

NEW, \$125.00 RECONDITIONED, \$75.00  
Extra Wire. New, 500 ft., \$3.50; ½ mile reel, \$10.50; 1 mile reel, \$16.00.

Purchase orders accepted from firms with D. & B. rating. No C.O.D. All prices F.O.B. Sacramento.

ORDER BY MAIL! Send check or money order to

### LORIS SALES

P. O. Box 1896, Dept. 3 Sacramento, California

# SYNCHRONOUS MOTORS

## 3160/2200 Volts

2—50 HP, G.E., Type TS, .8PF, 600 RPM  
1—100 HP, Westinghouse, 1.PF, 1200 RPM  
1—150 HP, G.E., Type ATI, 1.PF, 900 RPM  
1—500 HP, G.E., Type TS, .8PF, 720 RPM

## 3160/440 Volts

1—60 HP, Type TS, .8PF, 1200 RPM  
1—100 HP, Type TS, .8PF, 900 RPM  
1—150 HP, Type TS, .8PF, 900 RPM

All the above motors are equipped with starting equipment.

**The Motor Power Co. of New York, Inc.**

859 Madison Ave.

New York 21, N. Y.

RHinelander 4-6478

### SHOVEL FOR SALE

Model 6, Northwest Shovel, 1½ cu. yd. bucket — Standard Front.  
In A-1 operating condition.

**HALLETT COAL CO.**

Box 6

Shinnston, W. Va.

Marion 20 yd. elec. dragline, 180' bm., cata.  
Walter 12 yd. Diesel end dump trucks (5).  
Autocar 10 yd. dump trucks, gas, (6).  
Plymouth 20 and 10 ton gas locomotives.  
Whirley portal gantry crane, elec., 50 ton.  
B. Erie 52-B 2-1/3 yd. Diesel shovel-dragline.  
Steam-turbo power plant, complete, 2200 H.P.  
Porter-Vulcan steam locomotives, 18 ton, 36" ga.  
B. Erie 2-1/3 yd. shovel, front att., 52-B, 55B.  
Traylor 8'x16' rotary coolers, convertible.  
H. Y. SMITH CO., 828 N. Broadway, Milwaukee 2, Wis.



# for IMMEDIATE DELIVERY of RUBBER PRODUCTS

CALL  
WIRE

WRITE **CARLYLE**  
THE RUBBER HEADQUARTERS

CONVEYOR BELTING,  
TRANSMISSION BELT-  
ING, ELEVATOR BELT-  
ING, FIRE, WATER, AIR,  
STEAM, SUCTION and  
WELDING HOSE

CARLYLE RUBBER PROD-  
UCTS ARE NEW, GUAR-  
ANTEED & LOW PRICED

## CONVEYOR BELTING

ABRASIVE RESISTANT COVERS				Width Ply Top-Bottom Covers			
48"	8	1/8"	1/16"	24"	4	1/8"	1/32"
42"	5	1/8"	1/16"	20"	5	1/8"	1/32"
36"	6	1/8"	1/16"	20"	4	1/8"	1/32"
30"	6	1/8"	1/16"	18"	4	1/8"	1/32"
30"	5	1/8"	1/16"	16"	4	1/8"	1/32"
26"	5	1/8"	1/32"	14"	4	1/16"	1/32"
24"	5	1/8"	1/32"	12"	4	1/16"	1/32"

Inquire For Prices — Mention Size and Lengths

## TRANSMISSION BELTING ENDLESS "V" BELTS

HEAVY-DUTY FRICTION SURFACE							
In-	Width	Ply	Width	Ply	Width	Ply	
quire	18"	6	10"	6	6"	5	"A" Width All Sizes —
For	16"	6	10"	5	5"	5	"B" Width All Sizes —
Pric-	14"	6	8"	6	4"	5	"C" Width All Sizes —
es —	12"	6	8"	5	4"	4	"D" Width All Sizes —
Men-	12"	5	6"	6	3"	4	"E" Width All Sizes —
tion							Sold in Matched Sets.
Size							Inquire For Prices —
and							Mention Size and Lengths.
Lengths.							

## SPECIAL OFFER . . . HEAVY DUTY RUBBER HOSE

### FIRE HOSE

APPROVED SPECIFICATION HOSE EACH  
LENGTH WITH COUPLINGS ATTACHED

I.D. Size	Length	Per Length
2½"	50 feet	\$28.00
	25 "	16.00
2"	50 "	23.00
	25 "	13.00
1½"	50 "	20.00
	25 "	11.00

Specify Thread On Couplings

### AIR HOSE

I.D. Size	Length	per Length	Universal Couplings
½"	25 feet	\$5.00	\$1.50 Pair
	50 "	10.00	1.50 Pair
¾"	25 "	7.50	1.50 Pair
	50 "	15.00	1.50 Pair
1"	25 "	10.00	1.50 Pair
	50 "	20.00	1.50 Pair

LARGER SIZES ALSO AVAILABLE  
All Prices—Net — F.O.B. New York

### WATER HOSE

I.D. Size	Length	per Length	I.D. Size	Length	per Length
¾"	25 feet	\$4.25		35 feet	\$10.50
	50 "	8.00		40 "	12.00
1"	25 "	6.25		50 "	15.00
	50 "	12.50	1½"	25 "	10.00
1½"	25 "	7.50		35 "	14.00
				50 "	20.00

Each Length with Couplings Attached

# CARLYLE RUBBER CO., Inc.

62-66 PARK PLACE NEW YORK 7, N. Y. Phone: BArcley 7-9793

## CONVEYOR BELTS ONE DAY SHIPMENT

1,675 ft. 36 in. 6 ply — New  
1,120 ft. 36 in. 7 ply — Used  
362 ft. 30 in. 6 ply — New  
1,075 ft. 30 in. 5 ply — New  
1,630 ft. 24 in. 5 ply — New  
1,020 ft. 24 in. 4 ply — New  
1,528 ft. 18 in. 4 ply — New

## THE DARIEN CORP.

60 E. 42nd St., New York, N. Y.  
Tel. MU. 2-0042

## TRANSFORMERS

2—500 KVA Pittsburgh.  
1—500 KVA Westinghouse.  
3—250 KVA Westinghouse.  
3—150 KVA Pittsburgh.  
6—150 KVA General Electric.  
All single phase, 60 cycle, 23000/  
2300 volts, in operating condition  
and available for immediate del-  
ivery.

**W. G. Duncan Coal Company**  
Greenville, Kentucky

**Coal Tipple**—3 Tracks—Shaker  
Screens — Picking Tables —  
Loading Booms — Fully  
Equipped.

**Coal Tipple**—3 Tracks—Gravity  
Screens — Chutes — Weight  
Hopper and Scales.

**Endless Rope Haulage Engine**  
with 250 H.P. A.C. Motor.

**Joy Mechanical Coal Loader** —  
Type 5 B. U.

**300—42' Gauge Wood Mine**  
Cars—2½ Tons.

## LOWBER GAS COAL COMPANY

Bessemer Bldg., Pittsburgh, Pa.  
At. 6772

## FOR SALE SHAKING SCREEN

A modern Morrow Junior Shaking  
Screen in new working condition,  
suited to a 3-track tipple, complete  
with all accessories, as well as drive  
for feeder, and feeder, motor and  
all gearing. For quick sale contact  
Carbon Glow Coal Company, Car-  
bon Glow, Kentucky, Mr. Dixon.  
Equipment may be inspected at any  
time Premium, Kentucky.

## For Sale

One Goodman MS 7½ Trolley Locomotive...\$1000.00  
One Goodman MS6E Trolley Locomotive..... 750.00  
above 250 volt 36" gauge.  
Two 90° Angle Troughs with fulcrum jacks for Good-  
man size 3 Pan Line.

## PERSHING FUEL COMPANY

1012 Bankers Trust Building Des Moines, Iowa

## Lohite Rock Loader

1—Sullivan Lohite Rock Loader.  
Practically new. 15 H. P. AC  
Motor, 42" Gauge.

**HOCKING VALLEY BRICK COMPANY**  
LOGAN, OHIO

## FOR SALE SHAKER CONVEYOR

1 Goodman C-15 Shaker Conveyor, 300' Pan line  
with Duckbill Loader, 250v. D.C., new in July, or  
will trade on Short Wall cutting machine.

Phone Portersville 151.

Kerry & Sons Coal, R. D. #1, Harmony, Pa.

## FOR SALE

MH-88 Jeffrey 6 T. Locomotive.  
MH-96 Jeffrey 4 T. Locomotive.  
10 and 15 KVA 2400—120/240  
Transformers, 15 KVA 2400-V.  
Capacitors, 75 KVA 4160-V. to  
220-V., 3-phase, Transformers,  
Switches, Starters, Motors.

## SEND YOUR INQUIRIES

**Southern Industrial Marketers, Inc.**  
Box 429, Beckley, W. Va., Phone 4124

# MOTORS—M. G. SETS—CONTROL

**In Stock—Immediate Shipment—Rebuilt & Guaranteed**

## MOTOR GENERATOR SETS

1-9 KW. G.E. CD, 250-VDC, dir. con. 15-HP. G.E. Sq. Cg. Motor, 220/440-V., 3-Ph., 60-Cy., 1800-RPM.  
 1-50 KW. Louis-Allis, 124/240-VDC, dir. con. 75-HP. Sq. Cg. Motor, 220/440-V., 3-Ph., 60-Cy., 1200-RPM.  
 1-3-Unit G.E. (2) 27½ KW. CD generators, 275-VDC., 1750-RPM., dir. con. 100-HP. Sq. Cg. Motor, 220/440-V., 3-Ph., 60-Cy.  
 2-(NEW) G.E. 94 KW. 62½-VDC., Type CD generators, dir. con. 135-HP. Sq. Cg. Motor, 220/440-V., 3-Ph., 60-Cy., 1200-RPM., generator and motor R.B., splash-proof.  
 1-100 KW. Al. Chal., 125VDC. generator, dir. con. 150-HP. syn. motor, 2300-V., 3-Ph., 60-Cy., 900-RPM.  
 Will furnish any of above complete with D.C. panels and A.C. control.

## SYNCHRONOUS MOTORS

Qu.	Hp.	Make	Voltage	Speed
1	30	Whse.	220	1800
2	50	G.E.	2200	600
1	60	G.E.	440	1200
1	100	G.E.	440	900
1	100	Whse.	2200	1200
1	150	G.E.	440	900
1	150	G.E.	2200	900
1	150	G.E.	2200	1200
1	187	Elec. Mch.	440	900
1	500	G.E.	2200	720

Those among the above that do not have dir. con. after we will furnish with separate exciter sets, and can supply any of these motors complete with control.

## SLIP RING MOTORS

Qu.	Hp.	Make	Type	Volts	Rpm.
1	10	G.E.	I-M	220	1120
2	15	G.E.	I-M	220	1200

1	20	G.E.	MT-326	220	900
1	25	Al. Ch.	ANY	2200	850
2	25	G.E.	MT-326	2200	850
1	25	Whse.	CW	440	1750
1	30	Al. Ch.	ANY	440	900
1	30	Whse.	CW	440	1160
1	40	Al. Ch.	ANY	2200	435
1	40	G.E.	MT	550	580
3*	40	G.E.	I-M	600	1170
1	50	Al. Ch.	ANY	2200	490
1	75	G.E.	MT-548	440	1200
1	75	Al. Ch.	ANY	440	1750
1	125	G.E.	I-M	440	435
2	125	G.E.	MT	2200	900
2	150	G.E.	I-M	550	385
1	150	Whse.	CW	2300	1160
1	200	C.W.	127AQ	440	590
1	250	Whse.	CW	2200	450
1	300	Al. Ch.	ANY	2200	514
1	300	G.E.	I-M	2200	1200
1	350	Al. Ch.	ANY	2200	514
1	300	G.E.	I-M	440	600
1	400	Whse.	CW-1108	2800	500
1**	1150	Al. Ch.	ANY	2200	600
1**	1200	Whse.	CW	2300	600

\*—40-cycle.  
 \*\*—Heavy duty mill design.

## TRANSFORMERS

OIL-COOLED					
Qu.	K.V.A.	Make	Voltage	Ph.	Cy.
3	25	G.E.	1100/ 2200/	608	1 40
3*	37½	Whse.	460/ 230/ 230/115	1	60
3	50	Whse.	2300/ 440/ 220	1	60
2	50	Wag.	13200/11880/	575/287	1 60
3	130	G.E.	19000/ 9500/	550/2200	1 60
6	165/247	G.E.	38100/22000/	11000/430/215	1 60
1	200	Whse.	3810/ 2300/	440	3 60
3	200	G.E.	2400/ 4550-Y	13½/230/460	1 60
3	300	Whse.	2400/ 480/	240	1 60

## SQUIRREL CAGE MOTORS

### 3-PHASE, 60-CYCLE

Qu.	Hp.	Make	Type	Volts	R.P.M.
7	10	Whse.	C.S.	440	575
1	10	G.E.	HT-753	440	850
1	10	G.E.	E.R.	440	1090
1	10	G.E.	K-324	208	1750
1	10	Al. Ch.	X	220	1750
1	15	G.E.	M.T.	440	900
1	15	G.E.	N.P.	440	1160
1	15	G.E.	K.T.	440	3500
1	20	G.E.	X.K.	220	865
1	25	G.E.	F.T.H.	220	575
3	125	Al.-Ch.	K.T.	220	900
1	125	Al.-Ch.	C.S.	220	1100
1	25	Whse.	I.M.	2200	1200
1	35	G.E.	N	220	560
1	40	F.M.	A.H.	440	860
2	40	Al.-Ch.	B	220	1150
2	40	F.M.	K.T.	220	1800
1	40	C.W.	CS-650	220	1780
1	40	Whse.	X.E.	440	695
1	50	G.E.	C.S.	220	970
4	50	Whse.	K.T.	440	1100
1	50	G.E.	A.T.	440	1750
1	50	Ideal	FTR	440	720
1	75	Al.-Ch.	A.R.	2200	1750
3	75	Al.-Ch.	E.K.	2300	685
2	100	G.E.	CS-761	440	1750
1	125	Whse.	A.B.	2200	1750
3	125	Al.-Ch.	ARW	2200	1750
1	150	G.E.	I.K.	220	675
1	150	G.E.	I.E.	550	720
1	150	Whse.	C.S.	440	1200
1	200	G.E.	T.K.	2300	490
1	200	Al.-Ch.	A.B.	2200	3550
1	250	Whse.	C.S.	2200	1160

"We can supply with any of the above the necessary control equipment engineered to your specifications."

# T. B. MAC CABE COMPANY.

4314 CLARISSA STREET

PHILADELPHIA, PENNA.

## FOR SALE

1 Roberts & Schaefer Hydrotator and Classifier ½" x Minus. 25 Tons Per Hour.

**S. E. GANE & CO.**

508 Grant St. Pittsburgh 19, Pa.

## LOCOMOTIVE

50-ton Vulcan gas-electric, std. ga. Overhauled, with Am. couplers.

**THE INDUSTRIAL EQUIPMENT CORP.**

910 First National Bank Bldg., Pittsburgh 22, Pa.

## WANTED TO PURCHASE COAL BRIQUETTE PLANT

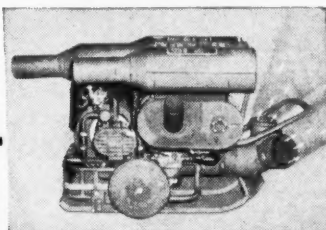
ANY SIZE—ANYWHERE  
STATE FULL PARTICULARS

W 3085, Coal Age.  
330 W. 42nd St., New York 18, N. Y.

## ANTHRACITE FINES WANTED 500,000 TONS OR MORE

W 3220, Coal Age.  
330 West 42nd Street, New York 18, N. Y.

# SALE



## PORTABLE HEATERS

Complete with flexible ducts. Excellent operating condition guaranteed.

Especially Adaptable for  
**MINE USE**

STEWART-WARNER portable powerful 100,000 BTU gasoline-burning Heaters complete with turbine type blower and 1½-hp. air-cooled ball-bearing engine.

## PORTABLE SELF-POWERED MANY PURPOSE HEATER

**HEATING**—Mills, Bunkhouses, Dry Rooms, Large Boarding Houses, Shops, Sheds, Warehouses, Buildings Under Construction, Spot Heating, etc.  
**THAWING**—Thawing Frozen Ore, or Preventing Freezing in Ore Bins. Thawing Frozen Areas, Machinery, Pipe Lines, Tanks, etc.  
**DRYING**—Drying Concentrates or Ore in Conjunction with Tumbler. Dry Wet Ore in Bins; Dry Plaster, Paint, Mortar, etc.  
**PRE-HEATING**—Engines, Tractors, Trucks, Equipment, etc.

**ORIGINAL COST . . . \$583.00**

**SALE PRICE . . . \$195.00**

Send for Literature

**BERNSTEIN BROTHERS**

PUEBLO Since 1890  
Dept. M-4 COLORADO

## ROTARY CONVERTERS

200 KW GE. SYN. 275 V., 6 Ph., 60 Cy., 1200 RPM. Pedestal Type. 2300/4000 V. Transformers and Switchgear.

## MOTOR GENERATORS

500 KW GE. SYN., 575 V. 2300/4000 V., 3 Ph., 60 Cy., 900 RPM. Complete Manual Switchgear.

400 KW WEST SWN. 575 V., 2200 V., 3 Ph., 60 Cy., 720 RPM. Complete Manual Switchgear.

300 KW RIDGWAY SYN., 275 V., 2200 V., 3 Ph., 60 Cy., 1200 RPM. Complete Manual Switchgear.

200 KW RIDGWAY SYN. 275 V., 2200 V., 3 Ph., 60 Cy., 900 RPM. Complete Manual Switchgear.

## LOCOMOTIVES

10-T JEFFREY, 250 V., MH-110 Mts., 36"-48" Ga.  
 10-T WEST., 500 V., 907-C Mts., 36"-44" Ga.  
 10-T WEST., 250 V., 907-C Mts., 36"-44" Ga.  
 8-T WEST., 250 V., 906-C Mts., 42"-48" Ga.  
 6-T G.E., 250 V., HM-701 Mts., 22"-32" Ga.  
 6-T WEST., 250 V., 903-B Mts., 22"-30" Ga.

Each unit listed above is owned by us and is available now for immediate purchase

**WALLACE E. KIRK COMPANY**  
Incorporated

501 Grant Building, Pittsburgh, Pa.

An asterisk preceding manufacturer's name indicates detailed information may be found in the 1946-47 MINING CATALOG

An asterisk preceding manufacturer's name indicates detailed information may be found in the 1946-47 MINING CATALOG

212 December, 1947 • COAL AGE



# TRU-LAY *Preformed* for SLOPE HAULAGE

Slope haulage wire ropes whip, jerk and skid across rails, ties and the ground. Yet it is in just such service that TRU-LAY *Preformed* proves its ability to take punishment.

The wire rope for slope haulage is TRU-LAY *Preformed* in either I.P.S. or P.S. It gives better and longer service. It represents the proper combination of strength and toughness for the most grueling jobs. With this combination go long experienced engineering and thorough step-by-step inspections. And TRU-LAY *Preformed* comes in all constructions . . . all lays . . . all centers.

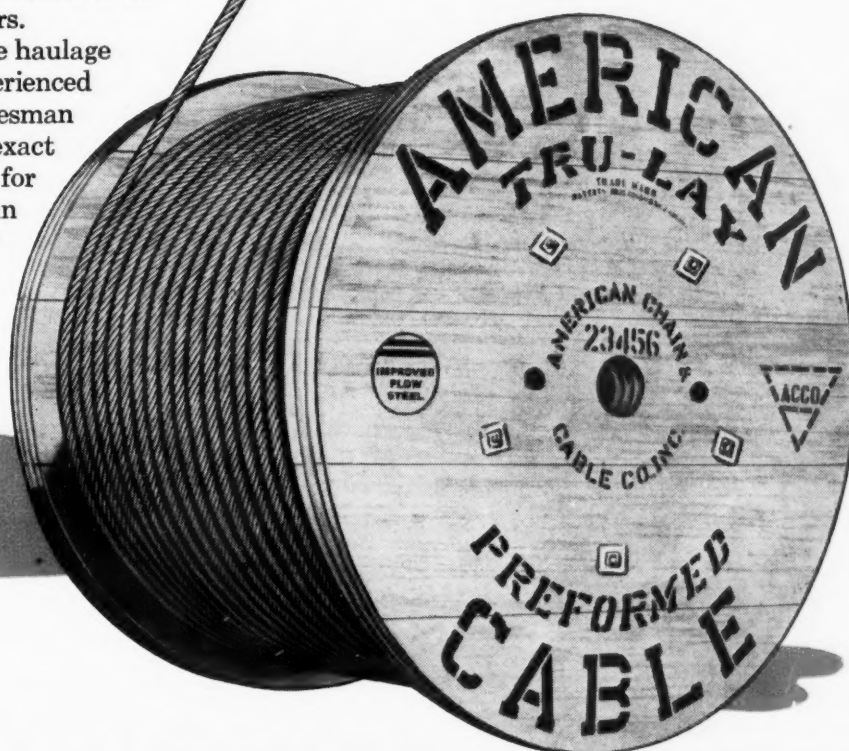
If you are buying wire rope for slope haulage or any other job, get the help of an experienced American Cable engineer. Every salesman of American Cable wire rope has the exact specification (construction and grade) for every wire rope application. He can save you time and money. Write for him today.

**LASTS LONGER**

**HANDLES EASIER**

**LESS LIKELY TO KINK**

**SPOOLS BETTER ON DRUM**



**ACCO**

Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Tacoma, Seattle, Bridgeport, Conn.

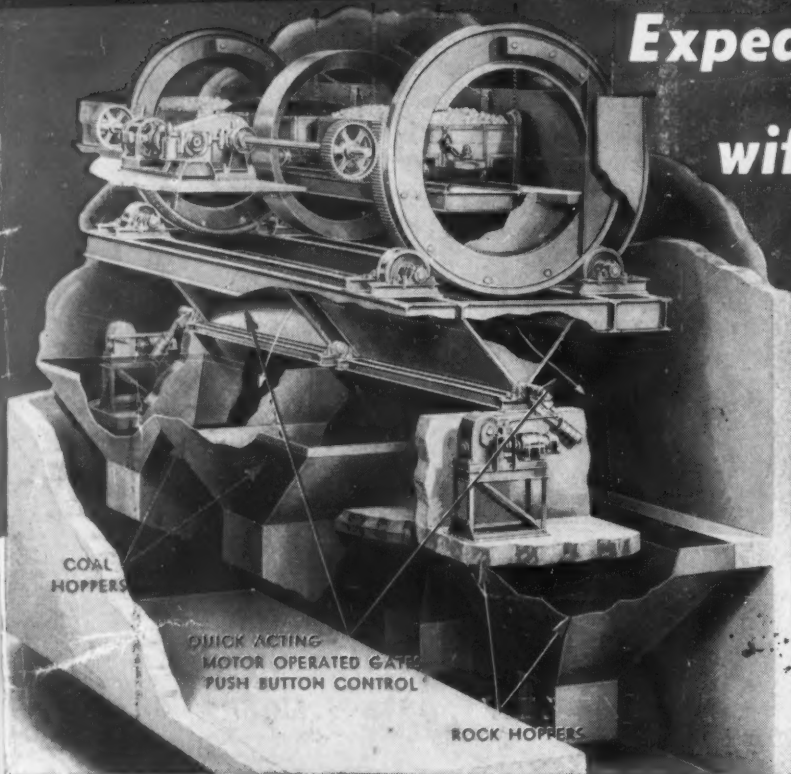
**AMERICAN CABLE DIVISION  
AMERICAN CHAIN & CABLE**



*In Business for Your Safety*

# Expedite Car Movements

## with **LINK-BELT** STANDARD CAR DUMPER



Left: Gear driven rotary mine car dumper; can be dumped in train or coupled. Below, center: Traction type full-revolving dumper for swivel-coupled mine cars. Bottom: Rotary railroad car dumper at Frick Coke Co., Grindstone, Pa.

**HIGHER CAPACITY**  
**LESS HANDLING COST**  
**LESS DEGRADATION**

**---with standard units**

Faster movement of mine or railroad coal cars means higher capacity, lower handling cost, better labor conditions—all adding up to big savings that liquidate the investment in mechanical car dumping.

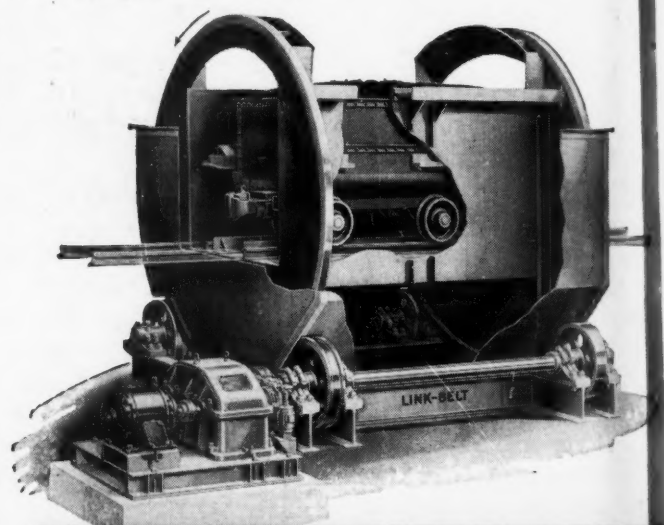
Link-Belt standardized units put mechanized car dumping within reach of small as well as large operations. We build multiple mine car dumpers to handle as many as 10 cars at once . . . traction type full revolving dumpers for swivel coupled mine cars . . . gear driven revolving mine car dumpers, with motor operated fly gates . . . rotary railroad car dumpers . . . Link-Belt system of car feeder haulage . . . and special equipment.

We'd like to work with you towards increasing America's coal production, whether by means of car dumpers or complete coal preparation plants.

### LINK-BELT COMPANY

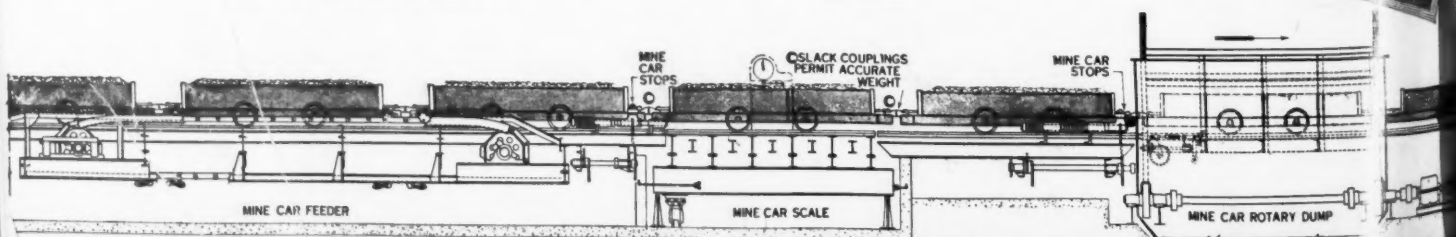
Chicago 9, Philadelphia 40, Pittsburgh 19, Wilkes-Barre, Huntington, W. Va., Denver 2, Kansas City 6, Mo., Cleveland 13, Indianapolis 6, Detroit 4, St. Louis 1, Seattle 4, Toronto 8.

10,804



Send for this new catalog, No. 2048-A, featuring Link-Belt rotary dumping equipment for mine cars and railroad cars.

Below: A typical Link-Belt car feeder haulage system.





a train of  
er for the  
per at H

WK-BEL  
RY DUMPER  
MINE CARS  
DAD CARS